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MUSEUMS ASSOCIATION.

LIVERPOOL MEETING,
1890.

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MUSEUMS ASSOCIATION.

REPORT OF PROCEEDINGS

WITH THE PAPERS READ AT

THE FIRST ANNUAL GENERAL MEETING

HELD AT LIVERPOOL, JUNE 17, 18 & 19, 1890;

TOGETHER WITH A SHORT ACCOUNT OF THE

FORMATION OF THE ASSOCIATION.

EDITED BY

H. M. PLATNAUER, B. Sc., & E. HOWARTH, F.R.A.S.

PUBLISHED BY THE ASSOCIATION,
1890.

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Museum
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THERE has long been a desire amongst Curators and others interested in the welfare and progress of Museums for a bond of union whereby the Museums in different localities could be brought into closer connection with each other, so that their work could be more uniformly and effectively carried on; and now that the Museums Association has been formed and has got to work, those interested in it fully recognise how very materially it may help to increase the scientific usefulness and educational value of these institutions. The fact that Museums are becoming, and may still further become, potent factors in education and scientific culture, is now generally recognised, and the day when such institutions were looked upon as mere receptacles for anything curious or abnormal has gone by for ever. But it is only comparatively recently that this decided growth in the interest taken in Museums has occurred, and that a juster appreciation of their purposes and functions has been created, due no doubt in some measure to the more general diffusion of education.

The desire for a Museums Association appears first to have found public expression in an article which appeared in *Nature* in 1877 by the Curator of the Sheffield Museum (Mr. E. Howarth) who called attention to some of the advantages that might arise from mutual co-operation among those whose tastes and duties charge them with the development and management of Museums, and it was afterwards suggested in the same periodical by Mr. James Paton of Glasgow, supported by Dr. A. B. Meyer of Dresden, that a conference should be held to consider and discuss the subject. Considerable difficulty was, however, experienced in bringing this about owing to the absence of any co-operation whatever among Museums.

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But in 1884 Mr. Howarth, at the request of several gentlemen interested in the matter, attended the annual meeting of the Library Association in Dublin, where he proposed that the Association should extend its sphere so as to include Museums in its organisation. Although this proposal was at the time favourably received, the Council of the Library Association afterwards decided that it was not desirable further to extend the area of their Association and the scheme therefore fell through. This, however, in no way diminished the desire for some organisation whereby means of communication among Museums could be established; the desire, indeed, became increasingly earnest, and it was felt that if some powerful Scientific Institution in the country would take the preliminary steps, the feeling among the more devoted workers in Museums was so strong as to leave little doubt of successful results.

This duty was most efficiently undertaken by the Yorkshire Philosophical Society, and any one at all acquainted with the difficulty of organising a new Association will fully realise the value of the work the Yorkshire Philosophical Society has done.

In February, 1888, the Council of the Yorkshire Philosophical Society sent a circular to 24 Museums selected from amongst the best known in England, suggesting a conference on the formation of a Museums Association. So encouraging were the answers to this circular that in April further circulars were issued inviting the Curators of the Museums in question to meet in York for the discussion of the matter, and May 3rd was finally fixed as the date of the meeting. The meeting was, at the kind Invitation of Mr. S. W. North (Vice-President of the Yorkshire Philosophical Society), held at that gentleman's house. Mr. North, who throughout has taken an active part in the formation of the Association, was unanimously elected Chairman; the other representatives present being:

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Mr. T. J. Moore, Liverpool.
Mr. C. G. Virgo, Queen's Park Museum, Manchester.
Mr. Butler Wood, Bradford.
Mr. W. W. Midgley, Museum, Bolton.
Mr. E. Howarth, Museum and Art Gallery, Sheffield.
Mr. C. Madeley, Library and Museum, Warrington.
Mr. J. W. Carr, University Museum, Nottingham.
Mr. R. Cameron, Museum, Sunderland.
Rev. W. C. Hey and H. M. Platnauer, York.

The Chairman called upon Mr. Platnauer to read the circulars convening the meeting.

Museum, York.

Sir,

It is proposed to call a meeting of the Curators of a few provincial Museums to consider the advisability of establishing a Museum Association for mutual help, and more especially to discuss the possibility of obtaining the following objects.

(1.) A compendious index of the contents of all provincial Museums and collections.

(2.) Some method of facilitating the interchange of specimens and books between various Museums.

(3.) The full discussion of the best plans for arranging Museums and classifying their contents.

(4.) The organization of some concerted action for the obtaining of such Government publications as are interesting or important from a scientific point of view.

In case such a meeting as the above is called may we reckon upon your sympathy and support.

Yours faithfully,

H. M. PLATNAUER.

February 29th, 1888.

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The Museum, York

Dear Sir,

The Council of the Yorkshire Philosophical Society invites you to attend a meeting of Curators of provincial Museums to consider the following points:

(1.) The desirability of forming a Museum Association.

(2.) The constitution and government of such Association.

(3.) A few of the more important objects which such an Association should keep in view.

Three dates are suggested for this meeting, May 2nd, 3rd, 4th, and it is intended to fix upon that day which is most convenient to the majority of those invited. Would you kindly let me know *before* April 20th if you have any preference, and if so, which day will suit you best.

Yours faithfully,

H. M. PLATNAUER.

April 12th, 1888.

The Chairman then briefly reviewed the steps taken in calling the Meeting and pointed out some of the advantages to be derived from the proposed Association. The objects of the Association were freely discussed by the representatives present, with special reference to the following points:—

Interchange of duplicate specimens.

Concerted action for securing Government publications.

The issue of a Journal by the Association, and the collecting of scattered original papers in the said Journal.

The indexing of the general contents of Museums

The inter-communication of ideas upon practical subjects, especially questions of arrangement and classification.

Finally it was unanimously resolved that the Provincial Museums of England should be approached and the following suggestions offered for their consideration:—

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I.—That a Museums Association be formed.

II.—That this Association consist of Curators and those engaged in the active work of Museums, and also of representatives of the Committees or Councils of management of such Museums.

III.—That the Association publish a volume of practical papers, and, if possible, of original scientific contributions, and also hold periodical Meetings, at least once a year in different towns.

In the following year (1889), the Council of the Yorkshire Philosophical Society sent a circular to all English Museums embodying an account of the above Meeting and of its recommendations and inviting Museum representatives to meet in York, on June 20th 1889, for the formation of an Association. It was suggested that each Museum should be represented by its Curator and two or more Members of its Committee or managing body.

In consequence of this invitation, a Meeting was held in York, on June 20th with Mr. S. W. North in the chair. The Minutes of this Meeting are given below.

MINUTES OF MEETING HELD JUNE 20TH, 1889.

PRESENT.—Alderman H. TURNER (Stockport); J. M. E. BOWLEY (Sunderland); R. CAMERON, J.P. (Sunderland); W. W. MIDGLEY, F.R.M.S. (Bolton); F. J. GEORGE, F.G.S. (Northampton); J. H. PHILLIPS (Scarborough); J. TYM (Stockport); E. HOWARTH, F.R.A.S. (Sheffield): B. WOOD (Bradford); J. W. CARR, B.A. (Nottingham); Rev. H. H. HIGGINS, M.A. (Liverpool); B. LOMAX, F.L.S. (Brighton); S. W. NORTH, F.G.S. (York); Rev. W. C. HEY, M.A. (York); H. M. PLATNAUER, B.Sc. (York).

The following Resolutions were adopted:—

I.—"That a Museums Association be formed."

Moved by Rev. H. H. HIGGINS,

Seconded by W. W. MIDGLEY.

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II.—"That this Association consist of Curators and those engaged in the active work of Museums, and of representatives of the Committes, or Councils of management, of such Museums."

Moved by ROBT. CAMERON.
Seconded by J. W. CARR.

III.—Resolved on the motion of W. W. MIDGLEY, "That the government of the Association be vested in the hands of a President, two Secretaries, and a Committee of five."

IV.—Resolved on the motion of R. CAMERON, "That the President and Committee be subject to annual re-election."

V.—Resolved on the motion of REV. H. H. HIGGINS, "That it is desirable that the President for the time being be chosen from the town in which it is proposed that the Meeting should be held."

VI.—"That each Museum contributing not less than one guinea a year be a Member of the Association and that individuals interested in scientific work be admitted as Associates on payment of 10s. 6d. annually."

Moved by E. HOWARTH,
Seconded by ALD. TURNER.

VII.—"That the next Meeting of this Association take place in Liverpool during May or June, 1890."

Moved by W. W. MIDGLEY,
Seconded by E. HOWARTH,

VIII.—On the motion of R. CAMERON, seconded by J. W. CARR, the REV. H. H. HIGGINS was elected President.

IX.—H. M. PLATNAUER (York), and T. J. MOORE (Liverpool), were elected Secretaries.

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The following were elected to constitute the Committee:—

S. W. NORTH, F.G.S., Vice-President of the Yorkshire Philosophical Society.

ALD. TURNER, Chairman of the Stockport Museum Committee.

R. CAMERON, J.P., Hon. Curator of Sunderland Museum.

E. HOWARTH, F.R A.S. Curator of Sheffield Museum.

B. LOMAX, F.L.S., Curator of Brighton Museum.

The following are some of the Subjects to which the consideration of the Society may be directed:—

1.—Means of interchange of duplicate and surplus specimens.

2.—Means of securing models, casts, and reproductions.

3.—Scheme for a general supply of labels, illustrations, and information.

4.—Uniform plan of arranging Natural History collections.

5.—Scheme for securing the services of specialists.

6.—Improvement of Libraries and Museums legislation.

7.—The indexing of the general contents of Museums.

8.—The promotion of Museum lectures to working men.

9.—Preparation of small educational loan collections for circulation among schools.

10.—Concerted action for securing Government publications and also specimens, on loan or otherwise.

11.—The issue of a Journal by the Association and the collecting of scattered original papers in the said Journal if found possible.

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These minutes were printed, and a copy sent to each Museum in the United Kingdom; the list used being that published by the Committee upon Provincial Museums, in the British Association Report, for 1887.

This was followed by the First Annual General Meeting of the Association held in Liverpool, June 17, 18, & 19, 1890.

The appointment of a strong Local Committee ensured the most satisfactory arrangements for the Meeting, which was an entire success; special thanks for this being due to the Library, Museum, and Arts Committee, which kindly placed at the service of the Association, suitable rooms for its meetings; to the President (the Rev. H. H. Higgins, M.A.), Mr. T. J. Moore, Mr. P. Cowell, Mr. R. McMillan, and to Mr. H. A. Tobias and Mr. R. Paden, the Hon. Secretaries, who unremittingly exerted themselves to make the arrangements satisfactory and complete.

Special thanks are also due to His Worship the Mayor of Liverpool (Mr. Thomas Hughes), for the hospitality he extended to the Members of the Association; and to Mr. J. L. Bowes, who kindly opened his house to the Members to inspect his unrivalled Japanese Art Treasures, and received them with the most cordial hospitality. The luncheon given by the Mayor in the Town Hall was one of the most pleasant gatherings of the Meeting, not only on account of the generous hospitality displayed, but from the exceedingly friendly feelings evoked, which found felicitous expression in the speeches made by the Mayor and several Members of the Association. The evening spent with Mr. Bowes will leave a lasting impression on the minds of all who had the privilege of inspecting the rich art treasures of his house and partaking of his liberal hospitality, and for the excellent and tasteful arrangements made for the comfort and pleasure of the visitors.

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The meeting at Liverpool, when important papers were read and interesting discussions followed, showed the great advantage likely to accrue from bringing together persons engaged in Museum work, and clearly demonstrated that in making possible such conferences, and publishing their proceedings, the Museums Association is doing a very valuable and much needed work. But this is far from being the limit of the good which such an Association may do, and it will be well, even in this early stage of its career, to endeavour to point out what will be the most practical and beneficial way of carrying out to its fullest extent the true work of Museum combination. It is quite evident that something more is necessary than an annual discussion of Museum topics, and an annual publication of proceedings; and it is highly desirable that some method should be adopted for making known Museum wants, for providing a channel for exchanges, for disseminating new ideas of Museum arrangement, and in fact, furnishing a regular means of intercommunication throughout the Kingdom. This could probably most efficiently be done by the publication of a Museum Journal at regular and not too distant intervals, and this Journal should be open to the reception of all matters bearing on Museum work. If such a publication could take the form of a monthly Journal, it would probably best meet the requirements of the Association, for, not only would it contain the papers read at the Annual Meeting, but Museums could state therein their desiderata, and what specimens they could offer for exchange, and by this means, while some Museums might get rid of their superfluities, other Museums, by mutual exchange, could fill up their gaps.

A page or two each month devoted to queries and replies would be likely to prove of great service, for any Curator meeting with a difficulty in devising cases, fittings, or anything else required in Museum work, might, and very probably would, find that some other Museum had met, and, after much

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thought and trouble, got over the difficulty years ago. Most Curators could give numerous examples of enquiries of this kind made to them, and the present writer has had more than half a dozen such queries during the past year. How much better would it be then, to have a Journal, in which to insert such queries, with the knowledge that they would come under the notice of all Museums and be sure to find a satisfactory answer somewhere. Sufficient, has however, been said to show the extreme value and helpfulness a regularly issued Museum Journal would have, and when the Museums Association has reached the stage when all the Museums of the Kingdom will be included within its membership (and this no doubt it soon will, judging from the names of the many leading Museums and individuals who have already joined), both the literary material and pecuniary means will be amply sufficient to make such a Journal a decided success.

But for the present year only a single volume of proceedings can be issued, and this will embrace, besides the short early history of the Association already given, the publication in full of all the papers read at the Liverpool Meeting, together with the leading points brought out in the discussion, and the general business done at the Meeting.

One important result of the Meeting was the appointment of Committees to consider the best means of obtaining the assistance of specialists in Museums, and to consider the question of Museum labelling. No doubt these Committees will have valuable reports to present to the Association at its next Annual Meeting.

H. M. PLATNAUER.
E. HOWARTH.

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MUSEUMS ASSOCIATION RULES.

Adopted at the Liverpool Meeting.

1.—That this Association be called the "MUSEUMS ASSOCIATION," and shall consist of representatives of the Museums situated in the United Kingdom, and of other persons engaged in scientific work or interested in Museums, who may be admitted as Associates.

2.—The object of the Association shall be the promotion of better and more systematic working of Museums throughout the Kingdom. In order to promote a better knowledge of Museums, the Association shall meet in a different town each succeeding year.

3.—That each Museum contributing not less than one guinea a year be a Member of the Association, and that individuals interested in the scientific work be admitted as Associates on payment of 10s. 6d. annually.

4.—That each Museum be represented by three delegates, each having one vote. Each Associate to have one vote.

5.—That each Museum belonging to the Association and each Associate receive one copy of the publications of the Association.

6.—That the affairs of the Association be managed by a Council consisting of a President, two Vice-Presidents, two Secretaries, a Treasurer and eight ordinary Members. Three to constitute a quorum. All past Presidents to be *ex-officio* members of Council. The President, Vice-Presidents and two ordinary Members of Council to retire each year and to be ineligible for re-election for one year.

7.—The Council to be elected at the Annual General Meeting, and to hold office for one year. The Council shall have power to fill any vacancies that may occur in its ranks between Annual Meetings.

8.—That a General Meeting of the Association be held annually, for the transaction of business, the reading of papers, and the discussion of matters relating to Museums.

9.—The place and time of the Annual Meeting to be determined by the Committee.

10.—All new rules, and all resolutions affecting existing ones, to be submitted to the Annual General Meeting. One calendar month's notice to be given of all resolutions affecting the rules.

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List of the Council of the Museums Association.

PRESIDENT:

THE REV. H. H. HIGGINS, M.A.

TREASURER:

ALDERMAN W. H. BRITTAIN, J.P., F.R.H.S.

SECRETARIES:

H. M. PLATNAUER, B.Sc.

T. J. MOORE, COR: M.Z.S.

COUNCIL:

R. CAMERON, J.P.

Prof. W. BOYD DAWKINS, F.R.S.

E. HOWARTH, F.R.A.S.

B. LOMAX, F.L.S.

S. W. NORTH, F.G.S.

J. PATON, F.L.S.

F. W. RUDLER, F.G.S.

DR. SCHARFF.

LIEUT-COL. H. TURNER.

A Committee, consisting of the following gentlemen, has been appointed to consider and report upon the question of a systematic scheme for securing the services of specialists for Provincial Museums—Mr. J. W. Carr, Mr. E. Howarth, Mr. J. Paton, Mr. F. W. Rudler, Mr. H. M. Platnauer.

A Committee was appointed to consider the question of labelling in Museums.

The following gentlemen are Members of this Committee —Mr. R. Cameron, Mr. E. Hoyle, Mr. J. W. Carr, Mr. E. Howarth, Mr. H. M. Platnauer.

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List of Museums and Associates belonging to the Association, with the names of the representatives present at the Liverpool Meeting.

Blackburn: *R. J. Howard; R. Ashton.*

Bolton: *W. W. Midgley, F.R.Met.S.*

Bootle: *J. Vicars; J. J. Ogle.*

Bradford: *Butler Wood.*

Cardiff: *John Storrie.*

Liverpool: *Rev. H. H. Higgins, M.A., T. J. Moore, Cor: M.Z.S.; R. Paden; J. Chard.*

Manchester (Owen's College): *Prof. Boyd Dawkins, F.R.S.; E. Hoyle.*

Manchester (Queen's Park): *C. G. Virgo.*

Northampton: *T. J. George, F.G.S.*

Nottingham: *J. W. Carr, M.A., F.G.S.*

Salford: *Major Plant, F.G.S.*

Sheffield (Public Museum): *Alderman W. H. Brittain, J.P.; E. Howarth, F.R.A.S.*

Stockport: *Lieut-Colonel H. Turner; John Tym.*

Sunderland: *R. Cameron, J.P.; J. M. E. Bowley.*

Warrington: *L. G. Greening; H. Roberts; F. W. Monks; C. Madeley.*

York: *H. M. Platnauer, B.Sc.*

Barnard Castle (Bowes Museum).

Brighton.

Glasgow.

Hereford.

Hull.

Maidstone.

Saffron Walden.

Scarborough.

Sheffield, (Ruskin Museum).

Southampton.

Worcester.

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ASSOCIATES:

Mrs. Argent ... Liverpool.
W. J. Argent ... ,,
T. H. Barker ... ,,
Dr. A. Barron ... ,,
F. A. Bather, B.A.
J. J. Christian ,,
J. Coffey ... ,,
J. J. Fitzpatrick ,,
Prof. Flower, C.B., F.R.S.
J. Forrester ... Bootle.
Willoughby Gardner L'rpool.
Rev. S. Gasking ,,
T. Greenwood.
W. Hewitt ... Birkenhead.
Dr. J. Sibley Hicks, L'rpool.
G. J. Hill, ... Blundellsands.
Ald. Howard ... Bootle.
Councillor Hughes ,,
T. McKenny Hughes.
Ald. Jones ... Bootle.
T. D. Lawrence, C.C., Liverpool.
Ald. Lunt ... Liverpool.
Councillor Lyons, Bootle.
J. Mackarell, ... Liverpool.
Councillor Mack ... Bootle.
F. P. Marrat, Museum, L'rp'l.
R. Mc. Millan, Liverpool.
G. F. Moore ... ,,
F. W. Monks, Warrington.
Wm. Narramore, Liverpool.
Rev. Nelson ... Bootle.
Mrs. O'Brien ... Birkenhead.
Miss Phipps.
Councillor Platt ... Bootle.
R. D. Radcliffe Liverpool.
Principal Rendall, M.A., Liverpool.
Mrs. Rendall ... Liverpool.
Dr. Ricketts ... Birkenhead.
H. Roscoe ... Liverpool.
F. W. Rudler, F.G.S.
J. W. Schofield, J.P., Bootle.
Councillor Swyny ... Bootle.
T. Tarleton .. Waterloo.
Councillor Thomas ... Bootle.
J. M. Toll, Anfield, L'rpool.
Councillor Wells ... Bootle.
,, Welsh ... ,,
Ald. J. Webster ... ,,
Dr. Glynn Whittle Liverpool.
Miss E. M. Wood ... Liscard.

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PROGRAMME OF THE LIVERPOOL MEETING, 1890.

TUESDAY, JUNE 17TH—

12 noon. Reception-room open.

7 p.m. President's Address in the Brown Lecture Hall of the Museum.

8 p.m. Reception and Soirée given by the Library, Museum, and Arts Committee.

WEDNESDAY, JUNE 18TH—

10 a.m. to 12-30. Reading and discussion of the following papers:—

"On Museum Organisation and Arrangement," by PROF. W. BOYD DAWKINS, F.R.S.

"Suggestions for aid in the determination of Natural History specimens in Museums." by F. W. RUDLER, F.G.S.

"A new method of mounting Invertebrates for Museum and Lecture purposes," by H. C. SORBY, L.L.D., F.R.S.

"Notes on the Liverpool Free Public Museum," by T. J. MOORE, Cor: M.Z.S.

"Circulating School Cabinets for Elementary Schools," by Mr. JOHN CHARD (Assistant in the Liverpool Museum.)

12-30. The scheme for the constitution of the Association, drawn up by the Committee, will be submitted to the General Meeting.

1-30. Luncheon in the Library.

Excursion to Chester.

THURSDAY, JUNE 19TH—

10 a.m. to 12-30. Reading and discussion of the following papers:—

"The best means of making Museums attractive to the public," by R. CAMERON, J.P.

"A plea for local Geological models," by T. J. MOORE, Cor: M.Z.S.

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"Museum cases and Museum visitors," by E. HOWARTH, F.R.A.S.

"Notes on the Moscow Museum," by Mr. WILLOUGHBY GARDNER.

"Winter Evening Lectures in Museums," by Mr. R. PADEN (Assistant in the Liverpool Museum.)

12-30. Election of Officers and selection of the next place of meeting.

1-0. Luncheon in the Library.

2-30. Trip on the River Mersey.

7-30. Soirée and Reception given by JAMES L. BOWES, Esq., Consul for Japan, at his residence: 3, Princes Road, Liverpool.

FRIDAY, JUNE 20th—

11-0 a.m. Visit to White Star Steamer "Majestic," by kind permission of Messrs. Ismay Imrie & Co.

1-0 p.m. Visit to the Bootle Grain Warehouses, by kind permission of JOHN CHRISTIE, Esq., Manager.

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LIVERPOOL MEETING, 1890.

Mr. S. W. North, Chairman at the York Meeting, being absent, Mr. Platnauer moved that Mr. Moore should take the chair as his substitute. This proposition was carried and Mr. Platnauer read the following letter from Mr. North:—

84, Micklegate, York,

June 15th, 1890.

MY DEAR MR. PLATNAUER,

Will you express to Mr. Higgins and the Members of the Museum Association assembled at Liverpool, my deep regret that circumstances beyond my control prevent my being present at the Meeting. I feel that the Assoctation, rightly constituted, has a great and important future before it.

To bring the whole of the museums in England into harmony; to establish a bond of sympathy between them—recognizing no great or small, only the common bond of knowledge and the desire for its diffusion—is a work worthy of the highest effort.

In the near future, to devise some method whereby they may be made on a more comprehensive scale, subservient to the spread of that technical knowledge, the desire for which is beginning to dawn, is another element of usefulness that the Association may well consider.

The programme settled at York last year is a good one, and forms the basis for much valuable work.

With my best wishes for the success of the Meeting,

believe me,

very truly yours,

S. W. NORTH.

H. M. Platnauer, Esq.

Hon. Sec. of Museums Associaton.

Mr. Moore then called on the President, the Rev. H. H. Higgins, to deliver his address.

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PRESIDENT'S ADDRESS.

I.—The Father of Natural History Museums.

II.—Museum Appliances.

III.—The New Knowledge.

BY

Rev. HENRY H. HIGGINS, M.A.,

CHAIRMAN OF SUB-COMMITTEE, LIVERPOOL FREE PUBLIC MUSEUM;
EX-PRESIDENT OF THE LITERARY AND PHILOSOPHICAL SOCIETY OF LIVERPOOL;
PRESIDENT OF THE LIVERPOOL NATURALIST'S FIELD CLUB.

THE thoroughly pleasant duty of welcoming to Liverpool the Members of the Museums Association requires on my part a very brief, but not therefore a less cordial, recognition on the present occasion.

The Institution in which we are assembled includes the Free Public Library, the Museum of Natural History and Ethnology, the Mayer collection of Antiquities and Curios, and the Walker Gallery of Art.

Your Association, gentlemen, last met in one of the oldest, and is now gathered in one of the most recent, of the British cities. On the 20th June, 1889, some of the promoters of the Museums Association were assembled under the auspices of the Yorkshire Philosophical Society in the historic building containing collections belonging to that learned body. These collections, it is well known, have been made available for the service of science in various publications, now widely recognised as of standard value. Such treasures must necessarily be of great interest to visitors engaged in Biological pursuits.

But, without in the least disparaging the importance of ample means for securing the very best museum arrangements, we are reminded by the logic of facts, that it is not

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always the sportsman who takes with him to the moors the largest battery, including rifles and smooth-bores of all descriptions, that always brings home the best proofs of his skill and success.

What, however, is meant by success in museum work? If, renouncing the conventional, we regard museum work in its intrinsic character, success therein is the teaching of truth, whatever form it may take, as communicated through lessons from objects.

It may be one of the most encouraging features of our fellowship, should this Association tend to confirm our conviction that the soul of the Museum is the Curator, and the kindred spirits that work with him.

Were a Museum ever so extensive, the living elements, and not the specimens, must determine its real value to the community.

But, assuredly, amongst the living elements may be included the life infused into the collections by full and attractive labelling, by orderly arrangement, by picturesque grouping, by loving care for what is beautiful; lastly, by facilities given for the comparison of every form with its allied forms; for such relations have been very links in their pedigrees and past lives.

This may seem a hard saying as denying permanence even to the most perfect models; but even so it should be. Time and the tide of knowledge inexorably leave a stationary Museum in a melancholy plight, as though it were submerged. If, however, any contingency could be fatal to Museums generally, it would be the imposition of a standard authorized manual, which should lay down rules for the exact management of all such institutions. One thing alone remains unalterably indispensable—the living spirit of man convinced

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that duly to work on the lines for which Museums are designed is an elevated calling of great honour and of genuine philanthropy. Let it be my endeavour now to show this.

Amongst the many Naturalists who have ennobled their names by their pursuit, and subsequently have reflected honour on their pursuit by their names, the present occasion may suitably bring into prominence CONRAD GESNER, who has been called the "Father of Museums." He was of Swiss origin, was born at Zurich, A.D. 1516, and seems to have been one of the most apt, indefatigable, and lovable of men.

With some of his biographers the admiration excited by his wonderful personal qualities was so great as almost to suggest a suspicion of undue partiality; but Hallam speaks of the erudition of Gesner as *prodigious;* of his work entitled *Mithridates*, as "the earliest effort on a great scale to arrange the various languages of mankind by their origin and analogies;" and of Gesner himself as "probably the most comprehensive scholar of his age."

Yet his fame rests chiefly on his almost incredible achievements in Natural History, on various departments of which he wrote many volumes, illustrated by thousands of figures, drawn by his own hand from specimens in his collection, or executed under his own eye by his assistants. His Museum of animals, plants, fossils, rocks, and minerals, attracted visitors from all parts of Europe. His correspondence was multifarious, and was carried on with learned men of every civilized nation; and all this was accomplished whilst he was living mainly on an income derived from his professional practice as a medical man; and this notwithstanding he was born of poor parents, was always delicate in health, and died before he was fifty years of age.

There were giants in those days. So there are now, but science is more exacting than it was: perhaps it is also less

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joyous; but its crowning merit in our days is its capacity for being extended to the people. Science is now a factor in a thousand lives to one in that period. Yet Gesner must have had many sympathizers; in fact, the amiability by which, using his natural history collections as attractions, he attached to himself a large circle of devoted friends, was one of the most remarkable features in a character otherwise distinguished in so many ways.

Hallam speaks of Gesner as the "first great naturalist of modern times; and Cuvier regards Gesner's *History of Animals* as "the basis of all modern zoology." It is difficult to agree with these estimates. He was rather a naturalist essentially of the middle age, or even of the pretransition period. He was the collector of materials for the structure of inductive science, not the architect.

He is said to have discovered genera in plants, and there is no doubt that he pointed out many of the characters on which genera have been founded. But he was ignorant of system, nor was he wholly emancipated from the yoke of the older philosophy and its accompanying credulity. In his famous *History of Animals* appears the figure of a monstrous Hydra with seven heads, each like that of a man; but he is careful to explain its fabulous character, and says that he wished to gratify his readers by the representation of a specimen so skilfully manufactured as to deceive for a time even the most incredulous.

His observations and extensive collections enabled him to see that there was vastly more in nature than had been previously noticed. He shows that plants which resemble each other in their flowers and seeds are more nearly related than those which have been brought into groups according to their size or economic properties. How fascinating must have been these first discoveries of true harmonies in nature to a man endued with such splendid capacities for knowledge!

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Gesner's delight was to ramble over the mountains in search of fresh treasures for his garden and Museum, and to write of them to distant friends. He took even long journeys on foot that he might the better collect; and planned with a friend to walk from Baden to Zurich that they might be the better able to gather flowers and talk of them by the way.

Conrad Gesner established in Zurich a botanic garden surrounding a Museum, and, according to his principal biographer, Schmiedel, amidst the riches of nature there stored up he was wont to spend his time. At the age of twenty he married a lady of Zurich, and though he had no family, his happiness seems to have been constantly and greatly promoted by the union.

One would like to have had a sight of the botanic garden surrounding his house and museum, but especially of the museum, which seems to have been built upon the simple plan of a large room on the ground-floor, lighted by fifteen windows. These windows he ornamented in a manner as unusual as it was agreeable. On each of them, says his biographer, "he painted most elegantly on the glass, arranged according to their classes, different species of marine, lacustrine, and river fishes." Surely this was in some sort a prefigurement of the plan for exhibiting live fishes now adopted in the best modern aquaria.

Who were his friends? Nay rather, "Who that was good and learned in those days was not the friend of Conrad Gesner? The scholar's doors were always hospitably open. He desired to compensate for his own inability to travel by hearing the discourse of men from all parts of the world." *

Gesner's death was quite in keeping with his life. Two of his intimate friends were ministers in Zurich, and with these he conversed calmly respecting his approaching end. A few hours before his death, he requested his attendants that they would carry him into his museum where he had caused a couch to be

*Essay by Henry Morley, highly recommended.

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prepared for him the day before. It was in this place, the scene of many of his laborious studies, and among the objects which he had collected with such indefatigable zeal, that he breathed his last in the arms of his wife, on the 13th December, 1565, not having quite completed his fiftieth year.

I have not been anxious to assign to Gesner his exact share in anticipating the science of a later period. Even to enumerate the titles of his larger works would be wearisome; and many of his best observations were recorded only in letters to his friends.

It was enough for him to have lived such a life. Let his name be associated with the study and love of nature, with delight in natural beauty, above all with his boundless passion for freely imparting to others a share in the happiness he himself had found in a knowledge of life and its glories, small indeed compared with that which has dawned upon our days. After him arose the age of keen competition, and of claims for priority of discovery. In his own country, famed as it is for leaders of thought, if there be a man of science venerated and almost worshipped as a benefactor, it is CONRAD GESNER.

Gesner's wish to die in his museum, will by some be regarded simply as an unenviable weakness. One winning feature, at all events, was there. How thoroughly the spirit of the Master must have been in unison with his work. The birds and the fishes and the plants brought with them to him no painful, no trivial, associations. His labours amongst them had in them nothing of a daily or weekly grind: or rather they had it—for it was work, and he was human—but the toil was so blended with a sense of peace, and gladness, and rest, and of the bliss of the imparting of joy to others, that he could wish his collections to be with him even at his dying hour.

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PART II.

MUSEUM APPLIANCES.

Under this heading it is proposed to give concise descriptions of the principal kinds of fittings and apparatus used in the Museum of Liverpool. It has been my endeavour to avoid the repetition of particulars which may be found in the hand-books now used for visitors to the institution. This has obviously led to a somewhat modified plan in the treatment of my subject.

Wall Cases.

Of the greatest importance amongst museum appliances are the wall cases, the frames, papering, and interior fittings-up of which have especially been made a study by our Hon. Sec., Mr. Moore. The measurements and combinations can only be stated in terms too technical for use on the present occasion.

Anti-Reflectors.

In the upper gallery of the Mayer Collection the examples displayed, on the top shelves of some of the wall cases, were rendered quite invisible by reflections from the skylight. This is not an uncommon inconvenience, and was perfectly remedied by allowing the top plate of the glass front to fall forward, and glazing the openings left at the sides.

Conspicuous Labels.

Labels in plain capitals on the cornices of wall cases are indispensable, but the streams of visitors passing immediately in front of the cases are apt, too often, to see nothing of the label over their heads, be the type ever so large. In many cases, letters an inch in length may be painted on the edges of the shelves, at the level of the eye, which cannot then well escape catching the title of the series of objects looked at. The plan is equally good for archaic or ceramic exhibits, and is adopted in the Wedgwood Collection in the Mayer Gallery.

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Index Collection.

In the same gallery with the Wedgwood ware is a short length of wall-case, having upper, middle and lower compartments, with specimens suitable for an Index Collection; corresponding with the modern or upper, mediæval or middle, and the ancient or basement stories in the Mayer Collection.

Balustrade Cases.

The top of balustrades in museum galleries forms an excellent site for exhibition cases, being in fact the very best position for objects of delicacy requiring close inspection. These cases are especially serviceable where it is desired to display a long series of objects in succession. Thus the balustrade cases in the East and West Stone Galleries surrounding the central hall, contain a small series of fossils, illustrating every formation from the Laurentian to the most recent strata. Larger specimens of the same groups occupy the wall cases opposite.

Cross References.

In the stone galleries, fossils of special interest have labels referring to corresponding recent forms in the zoological part of the collection. Thus a fossil displaying the fore and hind wings of a large Phasma-like insect, from the coal measures, Ravenhead, St. Helens, is referred to Bird-room No. V., Table-case XIX, Alliance 223, where may be seen kindred recent forms. My invaluable assistant, Mr. F. P. Marrat, has recently given especial attention to these hopefully instructive appliances.

The Eye-pieces.

Before passing from the balustrade cases, it may be mentioned that they form a very suitable lodgement for a mounted eye-piece, which is simply an eye-piece holding a lens, conveniently placed for the eye of the passer by, and having in its focus a single object, or the margin of a revolving disc, holding six or eight objects suitable for being examined by a low magnifying power.

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Thin sections of coal or coral, and examples of *Foraminifera Radiolaria*, and *Polyzoa* are suitable objects. But a low magnifying power might, in this way, be used very extensively and advantageously. For example, the stemmed, embryonic form of the common Feather-star, *Comatula*, is exhibited by the eye-piece in the immediate neighbourhood of examples of several species of *Pentacrinus* which are stemmed during life. The instrument is highly popular. When there is a fairly numerous attendance of visitors in the Museum, eye-pieces displaying coal sections, coral sections, etc., are rarely left without observers.

Picturesque Groups.

A gratifying indication of advancement in the arrangements adopted in Natural History Museums, is the prominence given to groups, including examples combined in various ways, illustrating the life-history, habits, and beauty of the species exhibited.

Fishes, although not remarkable for conspicuous life transformations, may be preserved so as to be almost life-like in external texture and colour; and a fine fish, accompanied by its skeleton, every bone in which is separate, but is held in its position by suitable wire work; and, for a third member of the group, a fossil fish, the nearest in affinity that can be procured. These three combined for comparison by observation, form a museum appliance of considerable value.

The Mammalia are so rich in interesting characters, and are so well adapted for combination in groups, that a smaller series in which some are thus arranged might be preferred to a much larger series in which no effort has been made to convey some appropriate impression of the animals in their past life-history and habits.

In birds, perhaps, is attained the climax of characters suitable for the æsthetic grouping of life forms. Such are the varied stages and often the gorgeous colours of the plumage, the picturesque habitations, the bewitching nests, the eggs with spots and rune-like dashes, as if every mother-bird had for her mate a language of love

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specially her own. In a score of ways a group of birds is obviously in strong contrast with an equal number perched side by side in rows on pedestals, like the spikes of an iron railing.

Mr. Ruskin's Museum.

Most of us have felt the unworthiness of the treatment received in museums by birds, not more than half a generation ago; but there was one who felt it as few others could, because he had such vivid conceptions of bird-life and of its place in nature. I refer to Mr. Ruskin. To him the ordinary case of stuffed birds was a caricature of a sacred thing. Early in May last I had the high gratification of a visit to a museum presented to Sheffield by Mr. Ruskin, and now deposited at Meersbrook Park in a mansion belonging to the municipality. For this never-to-be-forgotten gratification I was indebted to the kindness of my friend Mr. Howarth, Curator of the Sheffield Public Museum.

It was a surprise to find in Mr. Ruskin's Museum not a single example of animal or bird; but I was given to understand that Mr. Ruskin would not sanction the use of specimens, declaring that the only proper mode of illustrating living creatures in museums was by the use of the finest possible works of art in plates or coloured drawings representing the species; and this he insisted on especially with reference to birds.

Before we venture to censure this as extravagant, it would be safer to reflect on its origin. Mr. Ruskin may have spoken from his too ordinary experience in museums. If we ourselves have been unmoved by seeing birds in large collections crowded into a disorder, having no more significance of life relations than a medley of casts furnishing the image-board on the head of an Italian boy, we should only with much forbearance criticise the suggestions of men with more sensitive dispositions than ourselves.

In the Meersbrook Park Museum, Mr. Ruskin has chosen that his Natural History Collections should, in fact, take the form

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of a library chiefly of books of plates with one large central work of many volumes in which he has gathered richly coloured plates from various sources, not scrupling even to sacrifice such costly volumes as those of John Gould's *Books of Birds*.

Museums are now known to many of us in which sympathetic hands have placed groups of animals and birds such as might reconcile even Mr. Ruskin to the presence in a museum of something closer to nature than books of coloured plates. But the lesson to be derived from the Meersbrook Library-Museum will ever be that of tender respect, and even of some degree of reverence, towards the forms now motionless and silent, in which life once dwelt.

Much of my space has now been given up to vertebrate animals, with which I am less familiar, and which in this museum are wholly under the arrangement of our invaluable Curator and his staff, including our efficient assistant local secretary, Mr. Paden.

My motive for dwelling so long on this portion of the subject has been, that it is comparatively easy in the vertebrate tribes to see the necessity for picturesque groups, it being perfectly plain that mere rows of specimens, if they included every known species, would not worthily constitute a museum. A fine and rare example of a bird or an animal in its place in a public collection, does not represent the splendidly coloured figure given in Mr. So and So's magnificent monograph, but does represent a child of nature living in a home far away.

Table Cases.

On leaving the vertebrate sub-kingdom for that of the animals without bones, it seems almost as if one entered upon another sphere. The general size of the specimens is so diminutive, and the number of species so perplexingly multiplied. It is easy enough to count the Mammalia, but who can reckon the kinds of Insects ?

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A single quadruped may, with its family and environments, form a picturesque group; but a single mollusc appears to be a hopeless centre for such an assemblage.

In proceeding therefore to the legions of animals without bones, it must be fully borne in mind that the picturesque group is not adopted merely because it is artistic or pretty, though it certainly may be both without disparagement, but because it illustrates what may be seen in Nature; its special museum value being in the advantage thereby afforded to those who are willing to make observations by comparison.

We must not, then, suppose that the groupings desirable in the Invertebrates will in the least resemble those which we have left behind us in the beasts and birds. We can carry forward not the form, but only the spirit and meaning of the picturesque group. This it is that should put life into the museum arrangements of invertebrate animals, and give to their groupings, characters marking their constituents as members of a vast living unity. This I believe to be the highest aim in teaching by museums.

The problem seems to be how, in any portion of this vast sub-kingdom, to place a limited group of allied examples together in such a way as to illustrate their relations with their own life histories, and with those of other species, as being of one great stock with them.

Some years have elapsed since, in the British Museum, then in Great Russell Street, it was proposed to place the fossils of the *Crustacea* in immediate proximity with their recent examples. The plan was highly commended, but no provision was made for carrying it out in Cromwell Road. In a large collection it may be regarded as impracticable, except to the extent of a distinct typical or index series.

Something of this kind has been attempted in the Liverpool Museum, but no reason could be found for selecting a single

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relation only to be illustrated. The first appearance of the alliance in geological time is highly interesting, but perhaps still more so its geographical distribution, imperfectly but significantly taught by the comparison of British species with their exotic allies in the same group. Most needful of all—the general life-history label of the alliance, in plain language and clear type. Subordinately, in a Free Public Museum,—the anatomy and embryology in plates or models. As fully as possible the transformations, the uses, and economic products; natural deformities, breakages, and repairs by growth. These may advantageously be brought before the eye at once. And perhaps if such relations were more generally recognised in museums, beginners might be encouraged to restrict themselves less to the mere naming of species in a few orders, or a single order, and placing them in rows where there is scarce room for the bare visibility even of a minimised label.

It is needless for me to say more on the table-case, its upright compartment, its trays defining the limits of the alliance, or on the drawers in the cabinet below; especially since they have been noticed elsewhere. The system is evidently very definite, and its imperfections are only too inherent and obvious, but it was designed for the visitors of a free public museum. It is beyond a question that some of the simpler economic relations, *e.g.*, the pearls and the silks, the cameos, the gloves from pinna byssus, the shell-lac, the chank armlets, the wampum, the conchs, the coral beads, the honeycombs, carmine from the coccus, Tyrian purple from the murex, tooth powder from the cuttle-fish, flowerwork from barnacles, and beetles' wing cases; these and *many* others are a source of intelligent gratification to visitors who have neither guide nor guide-book, and for such the museum has to provide at an average of about 1,000 on open days, and on such a day as last Whit Monday of 6,000.

The Aquarium.

On many accounts, the use of an aquarium, if it be but a small one, in connection with a museum is most desirable. Aquaria are found to be extremely attractive; and are likely to lead to *out-of-door* natural history work.

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In midland counties Marine Aquaria are expensive, as compared with some other portions of the museum; but they are worth all they cost. Fresh water Aquaria are sadly under-rated; perhaps because, being much less costly, they are more common. One of the most exquisite objects in an aquarium I believe to be the large fresh-water spider, *Argyroneta aquatica*, when seen carrying down a supply of air to its silvery habitation far below the surface.

Reserved Cases.

This name has recently been given to certain table cases disposed in the central hall to meet a special purpose.

There are at present in the museum a considerable number of minor collections, chiefly zoological and ethnographical, for which there is no exhibition space. They are put away in receptacles of various kinds, and, unless asked for, are not seen.

It is proposed to bring out selected portions of these unseen stores and to exhibit them in the reserved cases for a period of two or three months, when they would be replaced by others. It is not desirable that reserved cases should join on with the main collection, otherwise they might become merged in it, and, at all events, one considerable advantage would be forfeited—the avoidance of over-crowding. There arises a strong tendency to over-crowding where beautiful things in reserve have to be squeezed in, or put altogether out of sight. But when they can have their own turn of exhibition, the temptation is less urgent to spoil the whole by crowding.

In the Public Museum at Sheffield I noticed ordinary visitors without an attendant, pulling out the drawers of a cabinet containing a collection of eggs, and apparently much interested with the specimens. This was very gratifying, and seemed to be a desirable step in advance; for birds' eggs are very liable to injury from long exposure to light.

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Circulating Cabinets.

Of these there are, now, about thirty. They are simply made, but strong, boxes, about 16 inches every way, with shelves and partitions for specimens in various departments of Natural History. They are sent to about sixty Board and Voluntary Schools, and changed monthly.

The experiment, which has now been tried for five years, has met with fair success. Complaints have been heard that "payment by results" has left but little time or zeal for subjects that do not bring grist to the mill. Still the interest awakened has been by no means small, and it will be interesting to watch for improvement.

Loan collections for congregational gatherings and teachers' meetings are highly appreciated. This collection includes two compound microscopes, each with 1 inch, and ½ inch objectives.

Details in full of the cabinets and their contents may be obtained from a pamphlet in use in the museum. Much importance is attached to the quality of the specimens. They need not be very numerous, but should be good and significant examples of their kind.

Mr. John Chard, our excellent Draughtsman Assistant, who has from the beginning, with great diligence and cordiality, carried out the circulating plan, and has attended at the schools to make all the exchanges, will be happy to exhibit such of the cabinets as may be at home, and to answer enquiries.

One of the Circulating Cabinets, known in the series as the Coal-box, contains examples of the following substances: —Coal, Lignite, Anthracite, Cannel, Jet, Cone-in-cone coal, Peacock coal, Spore coal, Fossil plants from coal-beds, Peat, Bog-moss, Club-moss, Graphite, Model of a diamond. Altogether about twenty specimens.

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Clinical Lectures.

During the winter months, on Monday evenings, lectures are given by the members of the museum staff and other friends, on portions of the collection, the peculiarity being that the specimens are not removed from their places, but the lecturer stands close by them and points out the interest of the objects, and the reasons for their position in the museum. The accommodation for the audience is limited to about one hundred; but the younger ones frequently adopt picturesque positions denoting their eagerness as listeners. The results are found to be satisfactory.

CONCLUSION.

The New Knowledge.

It would be an omission on my part were I to bring my remarks to a close without congratulating a pioneer association which has been seasonably initiated, and is now successfully established, amongst Librarians.

We are co-operating with them in an effort towards the advancement of knowledge, a movement which has been found to involve consequences far wider and deeper than were anticipated in the days of Dr. Dionysius Lardner and his colleagues of the Museum of Science and Art.

It must be well for us to have our hearts in our work, and for this purpose we must be satisfied that it is a good work, and that knowledge of a kind promoted by museums is an important benefit to man.

Nothing can be easier than to take this for granted, but a confidence so gained is but of little value in the day of trial, when opposition, or the want of sympathy, comes to search the foundation on which years, or even the greater part of a life, may have been devoted to museums.

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As members of our museum fellowship we are bound to be more or less familiar with the scientific side of the new knowledge, and must have felt the magnitude of the revolution it has brought about.

It has an equally potent moral side, from which I will ask you to consider an inference fraught with encouragement for the future. The new knowledge leads to the conclusion that the most exalted productions ever brought forth in poetry, philosophy or science were not obtained otherwise than in the orderly course of results which had gone before.

Shakespeare could not have lived 100 years before his time. His life was not a miracle, except as having its share in that ever energizing and enduring life miracle, in the presence of which we stand silent with bowed heads.

Galileo, Bruno, had their times prepared for them, and in their turn prepared the way for Faraday, Agassiz, Darwin.

Nor is there in our own days any, even the least, indication of an approach to finality. Gravitation, electricity, life, are unknown essences. In biology, some of the most illustrious discoveries still exhibit crudities and incompleteness removing them beyond a measurable distance from perfection.

Were they, then, not discoveries?

Assuredly they were, and in spite of all imperfections they are the glory of our times. But what we claim for our own knowledge we must grant to the attainments of our predecessors, admitting freely that there may be great good, and even great glory, in a very imperfect stage of knowledge, if it be *that* which is best fitted for environments.

This we have been slack in perceiving, because we have not realized how vast, how unique a thing, has been the flow of knowledge from age to age. Take the knowledge of any age—it is a goal; it has been tended towards, and reached by,

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the efforts and successes of many former ages; it is a terminus, long forecasted, towards which the steps of followers have been unconsciously directed, rendering it more and more accessible as generations came and went.

In another aspect, the very same epoch, with the same stage of knowledge, is not a goal, is not a terminus, but only a mere step in a vast progress; so that in this sphere of the development of human knowledge, an apparent paradox becomes an accomplished fact—the goal is progress, and, conversely, progress is the goal.

A flower-bud is not less admirable than an open flower. Perhaps it is even more lovable; but not till it be seen as a stage in the flower's life. Very much indeed depends on this. That which is fascinating in the prattle of the infant is the promise. Without the promise, how tiresome; but with it, how fascinating! The whole aspect of the past is changed, when, with all its defects, it is known as the germ of that which was to come after. *We* shall be the past; and our knowledge will be regarded in the retrospect. *We* shall form a part of the future to the end of time.

The ignorance which meets us daily is only the prolongation of the past, out of which past arose the very best and highest knowledge that we have to-day. An anonymous writer in the "Open Court" says, the triumph of a better future depends upon a due reverence for the merits of the past; or, in other words, we must know that "The new is the outcome of the old." How, otherwise, can we duly recognise the order and plan of the Supreme Life?

One of the most characteristic inferences to be drawn from the New Knowledge is—that imperfect creeds may possess a high value to their respective holders. There is always something sacred in them, and the intermingled error does not wholly destroy the virtue residing in the truth. What then becomes of the old *odium?*

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Evolution is taken to be the crowning characteristic of the New Knowledge. And so it is a *sine qua non*. But, in ourselves, if we entertain not sympathy of heart towards the evolved, it is pan-mechanical: it is not even a part of the New Knowledge; but is no more than a multiplication of old disjointed facts, indefinitely sub-divided, all of precisely the same magnitude, and of equal significance; capable, moreover of being indefinitely extended in number without any advance towards a higher conception of Nature.

In Robert Browning's *Paracelsus*, the hero, a short time before his death, gives utterance to a mournful retrospect of his life, although he had been a most devoted and successful follower of valuable and enduring knowledge. The light of the New Knowledge, as conceived by the poet, is caused to pass before the mind of the dying man, who passionately bewails his need of it. There is, I think, no doubt the following words of Paracelsus convey Robert Browning's view of the New Knowledge. To some they will seem extravagantly optimistic, but with them I will bring my address to a close.

Why was it thus with me? asks the dying hero, and to himself he replies—

> In my own heart love had not been made wise
> To trace love's faint beginnings in mankind,
> To know even hate is but a mask of love's,
> To see a good in evil, and a hope
> In ill success; to sympathize, be proud
> Of their half reasons, faint aspirings, dim
> Struggles for truth, their poorest fallacies,
> Their prejudice and fears and cares and doubts;
> All with a touch of nobleness, despite
> Their error, upward tending all though weak,
> Like plants in mines which never saw the sun,
> But dream of him, and guess where he may be,
> And do their best to climb and get to him.
> All this I knew not, and I failed.

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He failed; and yet in discovering that what he saw not was there and *might* have been apprehended by him, seems it not that he, in some sort, attained?

Too much that is parallel with the retrospect of Paracelsus might darken our reflections on the history of museums. They have done much. But there is a painful impression of something greater, to be done, which they have rarely attempted.

The conclusion can not be far away—that the highest aim of work in Public Museums is not—however ingeniously—to multiply facts in the *memories* of visitors, but to kindle in their hearts the wonder and the loving sympathy—THE NEW KNOWLEDGE—called for by every page in the remotely-reaching annals of Nature.

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ON MUSEUM ORGANISATION & ARRANGEMENT,

BY

PROF. W. BOYD DAWKINS, F.R.S.

THE question of Museum Organisation, and Museum Arrangement is one of those questions which are now coming to the front, in the spread of general education in this country, and it is one which offers unlimited opportunities for differences of opinion. I venture to approach it after an examination of the principal Museums in America and on the Continent, and with the experience—as Curator of the Manchester Museum—of more than twenty years standing of the practical difficulties in the way of converting heterogeneous collections, old and new, into a Museum fitted for modern requirements, and housed in a new building intended for the use of students and of the general public.

General Principles.

In dealing with the general question, it must be noted, that there is no scheme which is of general application. In each case the Museum organisation depends upon the local conditions. A Museum for example at Oxford or Cambridge should be especially aimed at the instruction of Students, a Museum in Manchester or Liverpool will be intended for the use not merely of Students, and the general public, but also have a side looking towards practical affairs. A great National Museum such as we possess in London is obviously organised on lines, and in proportions which would be wholly out of place in the provinces, and is or ought to be a centre in which, as nearly as may be, all objects relating to the history of the world and of man should be represented. The special end of a Museum must be kept clearly in mind, and the question of its being large or small is altogether secondary. A well arranged collection in a village is quite as likely to be of as much service to the parish, as the large Museum to the City.

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New Buildings.

In the construction of new buildings the maximum amount of light should be combined with the greatest amount of available space for exhibition, a condition which is not satisfied by any modern Gothic building. It must be remembered that the collections tend to increase as our knowledge increases, and that no Museum has yet been built which has been found large enough after a few years. The Natural History Museum at South Kensington was only built a few years ago, and is now so inadequate that it must be largely added to in the immediate future.

Laboratories and Libraries.

Whenever it is practicable, laboratories for the use of Students should be attached to the Museum, as in the case of the Smithsonian Museum at Washington, with a library which can be used with the specimens at hand. The books should be brought to the specimens, and the special memoirs relating to a particular group in the Museum should be kept near that group.

Fittings, Labels and Illustrations.

The Museum fittings should be as nearly dust proof as possible, and all multiples of a given size, which may be called "The Museum Unit." The labels attached to the specimens should be clearly printed in English as well as in Latin. A specimen in a case without a label is as much out of place, as a soldier in a regiment without a name. Group-labels also, and a boldly printed description, maps, plans and diagrams should be used as far as possible. In the Manchester Museum the group names are printed in red, and the specific names in black ink.

Specimens.

The specimens on show should be selected with great care and not overcrowded, those not on show being available for

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study in drawers. The so-called "Curiosities," from which all Museums have suffered in times past must be rigidly excluded, and only those objects shown which have some special call for exhibition.

Classification.

The classification of the contents of Museums falls naturally into three divisions:—

A. Those which illustrate the History of Nature—Natural History Museums;

B. Those which illustrate the History of Man—Archæological and Ethnological Museums;

C. Those which illustrate the History of Art—Art Museums and Galleries.

These three divisions are not sharply divided from each other, and, in practice, it is necessary to use, for the illustration of one, some of those things which, strictly speaking, belong to the others. Man and his works must find a place in all Natural History Museums, and the study of art cannot be isolated from Archæology and Ethnology. The City of Liverpool is singularly fortunate in possessing well arranged collections on these lines, which are practically under one roof—the Brown and Mayer Museum and the Walker Art Gallery.

The Arrangement in a Natural History Museum.

The arrangement of specimens in a Museum intended to illustrate Nature which commends itself to my judgment, and which has been carried out in the Manchester Museum (See Plans 1, 2, 3), is as follows:—

A. The Physical History of the Earth:—

(1) Minerals and groups of minerals associated together in mineral veins.

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(2) Aggregations of minerals in rocks—Igneous—Aqueous—Altered.

(3) The building up of rocks by existing causes.

(4) The destruction of rocks.

(5) Special groups.

(6) The effects of heat, movement and pressure on rocks.

All these groups belong to the closely allied sciences of Mineralogy, Petrology, and Physical Geology, and form a satisfactory starting point for a Museum arrangement which is based on *time*.

B. The History of life on the earth revealed by the study of the rocks.

(1) Archaian.

(2) Primary.

(3) Secondary.

(4) Tertiary.

The groups of fossils are arranged in the order in which they occur in the rocks, and, as far as possible, classified Zoologically. A further sub-division under the head of Land, Fresh Water, and Marine is also employed, groups of volcanic rocks mark the principal ages of volcanic activity; restorations, casts, pictures, maps and sections are used also to illustrate the conditions of life on the earth at the time, and to show the march of events.

In dealing with the Tertiary Period, I have found it impossible to draw a hard and fast line between the Eocene on the one hand, and the Historic Period on the other. In this division of the Museum collections which are on the first

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floor, and in contact with the Zoological collections, the gradual evolution of the higher mammalia is made a special point, and the sub-divisions employed are—

Eocene,
Meiocene,
Pleiocene,
Pleistocene,
Prehistoric,
Historic.

In the three last sub-divisions special prominence is given to the contents of caverns and to the finds in river-deposits, and more especially to those in great Britain.

Under the head of Pleistocene the specimens illustrating the presence of man in Europe form the most important feature, while in the Prehistoric, those relating to the various phases of civilisation, Neolithic, Bronze and Iron, through which the ancient inhabitants of Europe have passed, find their appropriate places. In the Historic sub-division a small and carefully selected collection of Egyptian, Assyrian, Greek and Roman articles, and of various objects in use among modern savages, closes the Tertiary series, and emphasizes the fact that History, Archæology and Ethnology are really parts of the same series of events as those which are recorded in the rocks. There is a place here for an unlimited development in the direction of art and archæology. In a Natural History Museum, however, neither artistic nor archæological objects *as such* have any place. In every case there must be some special ground for their presence.

In this arrangement which is, as I mentioned before, a time arrangement, the series of events which happened before the Historic Period is placed plainly before the eye, and the ground is cleared for the collection of Living Animals (section C Zoology) on the one hand and of Plants (D Botany) on the other. Zoology and Botany find their natural places

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in a Museum here. They should, in my opinion, be illustrated as far as possible by fossil intermediate forms, for Zoological and Botanical purposes, if Geological duplicates can be obtained. It is, in my opinion, far more important to have the geological record in a Museum as perfect as possible for the use of all men, than to scatter it among the living forms for the use merely of systematic Zoologists and Botanists. It is a practical advantage for the Zoological and Botanical student to walk from the cases where he is studying any living group, to those Geological cases which mark its position in the history of the world, and thus to understand its place *in time*. The inconvenience is small and the gain is great. I allude to this matter because it has given rise to much discussion during the last few years.

The arrangement of the Zoological part of a Museum should be mainly systematic. The principle, however, of association of different animals, and of showing also their surroundings is being carried out with great success by Dr. Flower, the Director of the Natural History Museum. The usual arrangement too of stuffed birds set up in rows is giving place to the method of preserving them in the skin, and of keeping them in drawers for the use of students. Representatives of the leading genera artistically grouped, as in the Museum at Newcastle, are all that are required for exhibition.

Spirit preparations are also a great difficulty in the Zoological world. They are very costly, and require continual care. It is adviseable to reduce them to a minimum in most Museums. Those necessary for show are not very numerous, and those which are for the instruction of Students in dissection may be well stowed away out of the Museum.

It is found practically useful to separate the Zoology of Britain from the general collection, both in the Manchester Museum and in the Natural History Museum at South Kensington.

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Lectures and Demonstrations.

There is one other, and, to my mind, an essential part of Museum organisation, which remains for discussion. The end of all Museums may be taken to be the advancement of knowledge. If a Museum appeals merely to idle curiosity it is a failure. If it tells the story of the various plants and animals now on the earth, and of the various phases of the Earths History, it becomes at once a valuable agent in general education. This can, in my opinion, only be done by teaching the people how to use a Museum. To this end, Museum lectures and demonstrations are indispensible. From my experience during the last ten years in Manchester and London I can see that this side of Museum work is likely to be of great service in general education, and that it is well worthy of the special attention of this Association.

In concluding this short outline of the principal points which have forced themselves on my notice as Curator of a Museum for many years, I must add that, in my opinion, this Association is likely to do good work in bringing the museums of this country into touch with the higher teaching, and in helping on the good time when they will become as well organised, as they are now in France, Germany, and in the United States.

MR. CAMERON maintained that we could base our claim for the support of Museums on something higher than mere utility. A knowledge of Nature is part of the higher needs of man, and that knowledge must, in many cases, be mainly derived from Museums. The best way to obtain true appreciation of the contents of Museums on the part of the working classes was to make the teaching of the principles of Natural History classification compulsory in elementary schools. Mr. Cameron then gave a short account of the groups of birds in the Sunderland Museum.

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Mr. STORRIE (of Cardiff) objected to the statement of Professor Boyd Dawkins that every specimen should be labelled before being put into a Museum case. He held that it was often impracticable to work according to this rule, and that in his own experience he was often obliged to exhibit specimens with no label except the one giving their locality.

Mr. PLATNAUER (York) said, that Professor Boyd Dawkins' paper would materially help forward one of the most important objects of the Society, viz: the education of the public mind as to the requirements of Museums. When this was done, much greater efficiency might be looked for in the future. At present the chief task of the Museum Curator was to make the best of the material now existing.

Mr. BUTLER WOOD (Bradford) asked for some details about a dust-proof case mentioned by Professor Boyd Dawkins as being in the Museum of the College of Surgeons.

Professor BOYD DAWKINS, in reply, stated that the dust-tight case consisted of glass let into a bronze frame, but added that the expense of the case was so great as to quite preclude the possibility of its general use in Museums.

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SUGGESTIONS FOR AID IN THE NAMING OF NATURAL HISTORY SPECIMENS IN MUSEUMS,

BY

F. W. RUDLER, F.G.S.,

CURATOR OF THE MUSEUM OF PRACTICAL GEOLOGY.

OF the many difficulties which beset the work of the Curator of a provincial Museum, there is none graver than the difficulty of having to name the specimens which are contributed to the Collections under his care. Many of these acquisitions must necessarily lie outside the range of his personal studies. Almost every Curator has his own hobby, and it is only natural that the Museum should take its complexion, in large part, from the tastes of its Custodian. If he be a Conchologist, he will pride himself upon his collection of shells, and as far as possible these will be correctly identified and satisfactorily displayed. But no man can be master of many subjects. How then can the Curator be expected to deal with the heterogeneous assemblage of objects, in many cases either unnamed or incorrectly named, which are constantly finding their way into a general Museum?

An attempt is often made to surmount the difficulty by the appointment of a number of Honorary Curators, each versed in a special department. Happy the Museum that can find a group of such men—competent, methodical and enthusiastic! In many provincial towns it is extremely difficult, if not impossible, to secure the aid of specialists; while in other cases it is found that voluntary aid, though of acknowledged ability, is rendered in so fitful and unbusiness-like a manner as to be eminently unsatisfactory.

It may perhaps be said that if a Curator is furnished with the standard works of reference he should be able to

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identify his own specimens, without extraneous aid. In the the first place, such works are expensive, so that it is only in first-class Museums that they are available. But even if available, they usually require a specialist to use them with advantage. The technical description of a species is not to be realized and utilized without considerable experience. It frequently happens that neither description nor engraving is sufficient; and it becomes necessary, even for the specialist, to compare the specimen in question with those in a collection authoritatively named.

If a Curator can take his specimens to the British Museum, he is of course safe. But how few can do this! There are not many Provincial Museums which can afford to send their officers to London for this purpose; and if the Curator comes up for his own holiday it is not to be expected that he should devote his time to such work. Moreover it is difficult for a man who is not a specialist to make valid comparisions; he requires the assistance of a trained observer, yet it is not reasonable that officers of a National Museum, however public spirited, should spend their time in identifying large collections of specimens for other Institutions.

It seems, therefore, desirable that some organization should be established for the purpose of assisting Curators in the determination of their specimens, and it is to the Museums Association that we naturally turn as the body which could most advantageously undertake such work. Hence I would venture to suggest that a Committee of Reference be appointed, and that a limited number of specialists in the several departments of natural history be invited to serve on this Committee. Their prime function would be to name, or assist in getting named, specimens sent up, from time to time, in small parcels, from Provincial Museums.

At first sight this may seem a rather formidable task, but many of the difficulties diminish or even vanish, on close

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examination. Suppose for instance, that a small Collection of Minerals is received. If it is an ordinary Collection, formed during the travels of some one with a taste for collecting, but without any profound acquaintance with the subject, it will probably contain much worthless material. The eye of a specialist, glancing over the Collection, will be able at once to eliminate a large proportion of the specimens as practically of no value. These would be set aside and returned to the Museum to be thrown away, or not, at the discretion of the authorities or of the donor, but under no circumstances to be publicly exhibited. Even if nothing more were done, this selection alone would be a great gain to the Museum. The separation of the useless from the useful can only be safely effected by an experienced hand, and a Curator should be thankful to a specialist for undertaking the responsibility of sweeping from his cases what is mere rubbish.

Of the remainder of the Collection the majority of specimens would probably belong to well-known species, capable of being determined at sight, and named off hand. There would, however, usually remain a number of specimens presenting more or less difficulty, and requiring careful comparison and examination. Supposing that time could not be spared for this examination, they could be returned to the Museum as worthy of preservation for future study, or they could be retained by the specialist for examination at his leisure. But even if these doubtful specimens were never touched again, much good would have been already accomplished. The outcome of the general examination would probably be the correct naming of nine-tenths of an ordinary Collection—surely a decided boon to any Museum!

It is not to be expected that busy professional men, whose time and knowledge represent their daily bread, could work in this way gratuitously. It is true that in some cases the Committee might be so fortunate as to secure the co-

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operation of certain specialists, whose circumstances would allow them to work for the mere love of the subject, or in the hope of finding in the collection new species or something sufficiently novel to furnish material for original papers. But in the majority of cases it must be a matter of pure business with the referees. If funds were not avilable for a thorough examination of a collection, it might yet be possible to secure a cursory and imperfect examination, as suggested above, since this would be an inexpensive undertaking.

Probably the best men to secure for such work would be the junior assistants in some of our great Museums, where each department has its own set of special workers, whose duty leads to the daily handling, comparing and naming of specimens. The examination of Collections for the Reference Committee would of course be work undertaken only in extra-official time. Experienced dealers in natural history specimens might also be entrusted with the work. But in all cases it should be carried out under the auspices of the Committee of Aid, who would see that it was systematically and conscientiously done, at a fixed and moderate scale of remuneration.

It would obviously be desirable to relieve the specialist by lightening his labours in every possible way, and thus diminishing the cost of his work. But it is not expedient in this paper to enter into details. My object is simply to bring the general subject before the Museums Association, with the view of ascertaining whether our members consider it feasible or not.

If such a scheme could be worked for natural history collections, it is obviously capable of extension to other classes of objects in Provincial Museums. Where, for instance, is the Curator—not himself a numismatist—who would not be thankful to have his coins examined by a specialist? Supposing the scheme successful, it might be doubtful whether it would be desirable for the Curator to

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accept the responsibility of naming *any* special class of objects under his care; whether in fact, time would not be gained, and certainty secured, by having *all* the Collections in a Provincial Museum similarly dealt with by a Central Committee. In that case the question might arise whether it is preferable for the Curator of a General Museum to be a specialist in any particular department of science, or to be a good all-round man of general culture, with methodical habits and administrative tact.

MR. HOYLE dwelt on the practical difficulties involved in Mr. Rudler's plan, especially the difficulty of finding specialists. He pointed out that only two or three men in Great Britain had any special knowledge of Sponges, and that with the present pitch of specialization the Crustacea would have to be sent to two or three different workers. He also dissented from Mr. Rudler's remarks on specializing, maintaining that Museum Curators were generally specialists, and ought to be specialists.

MR. MADELEY agreed with Mr. Rudler in thinking it unwise to depend upon Honorary Curators: few of them could be expected to devote to Museums the amount of time and care that was needed. He then discussed the question of Specialist Curators, pointing out some of the advantages of special knowledge, but deprecating hard and fast rules on such a subject.

MR. HOWARTH spoke of the great demands made by a Curator's work upon his time, and of the difficulty of finding leisure for specializing. He also pointed out the frequent need for general and extended knowledge on the part of a Curator.

LIEUTENANT-COLONEL TURNER referred to the increasing desire of Museum Councils to secure educated men as curators, and gave an amusing description of the state of affairs at Stockport, when he first became connected with the Museum.

MR. HIGGINS spoke on the subject of Specializing of Curators, and expressed his preference for a curator of wide and general, rather than special, knowledge. He considered, however, that the subject deserved full and thorough discussion before any general opinion was expressed.

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ON THE PREPARATION OF SPECIMENS OF INVERTEBRATA DRIED ON GLASS,

BY

H. C. SORBY, L.L.D., F.R.S.

AT Mr. Howarth's request, I send half-a-dozen examples to illustrate the method I have lately employed in preparing specimens of various Invertebrata. My principal object in the first instance was to mount them for my own use as lantern slides, but when so prepared, they would serve equally well as Museum specimens, and may indeed be satisfactory for that purpose when too opaque to show well as transparencies.

It would require a long paper to describe the precautions necessary in all cases, since almost each kind of animal needs special treatment. I also do not think it desirable to deal with this question generally now, since I am making this subject the chief work of this year's cruise, and nearly every days experience leads to material improvements. I shall therefore confine my remarks to the specimens sent in illustration.

Few animals are more easily prepared, and give more satisfactory results than *Chætopoda*. They should be slightly washed in diluted alcohol to remove the salt water, and then arranged on the glass, using enough of the diluted spirit to make this easy, and then drained and allowed to dry. *Sabella* is an excellent object. Small specimens may be mounted entire, with the plumes spread out, or larger used to specially show the plumes and the upper part of the body, as will be seen from the preparations, which will be greatly improved when mounted in Canada balsam.

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Nereis is also an excellent object. I send one showing the digestive cavity partially filled with mud eaten as food. This specimen is mounted in Canada balsam, which is a great improvement, though it involves far more trouble. In drying such worms on glass, care should be taken to properly spread them out, so that they may adhere over their entire surface, and not contract laterally and lose their true and natural outline. This may be done by the careful use of a finger, and, when nearly dry, irregular projections may be got rid of by gentle pressure with another piece of glass, adhesion to this being prevented by using a piece of blotting paper soaked with bees wax. Specimens so prepared and mounted in balsam show much of their anatomy (the larger blood vessels being well seen), and they look like pretty pictures, having none of the unattractive appearance they too often present when kept in spirit.

The preparation of some species of *Nudibranchs* involves a good deal of trouble, and even then, the results may not be satisfactory, but other species are easily managed, and give good results. As an example I send a slide of *Eolis*. If water alone be used to wash away the salt, the specimens are rapidly attacked and ruined, and if strong alcohol is used, they contract too much and lose their colour. If, however, a mixture of about equal quantities of water and spirit is used, the animals are easily spread out, and dry down flat without any pressure being necessary. As will be seen from the specimen the red pigment has been partially dissolved by the Canada balsam, but this result could I think be avoided, if thought desirable.

Probably, few objects could be more unpromising than *Medusæ*. In preparing them the first consideration is to get rid of the salt, since otherwise, when dried, little is obtained but large crystals of salt. By digesting them for some time in somewhat diluted alcohol, this result is avoided. In the case of *Aurelia*, the residual animal matter was very thin, and in its natural state showed little or no structure. When, however, before drying, the

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animal was kept for a while in some appropriate staining solution, most excellent results were obtained. As an example I send a specimen stained with hamatoxalin. The most difficult part of the process is the final mounting in Canada balsam, but I hope to be able to overcome the difficulties before long.

So far I have applied staining only in a sufficient number of cases to show how useful it may be made. As another example I send a preparation of the Ascidian, *Cyone intestinalis* stained with Beale's carmine. The object shows the entire animal and also the branchial sac cut in two showing its structure to great advantage.

I trust that these few specimens, and the short and imperfect account I have given of the manner in which they were prepared, will, at all events, suffice to show that in the case of some animals the method has even so far given good results, and may be expected to give far better in future. Of course, larger specimens can be mounted on larger pieces of glass than lantern slides, when required for Museum purposes; and I hope to succeed in using some material like glycerine jelly, more manageable than Canada balsam when mounting large objects.

Mr. MONTAGU BROWNE asked how long Dr. Sorby's specimens had been mounted and added, that, in his opinion, no method of mounting ought to be considered successful that had not stood the test of months.

Mr. HOWARTH said in answer, that the specimens he was exhibiting had not been long mounted. He promised to bring them, if possible, to the next meeting of the Association in order that the durability of the mounting might be tested.

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ON CIRCULATING MUSEUM CABINETS FOR SCHOOLS AND OTHER EDUCATIONAL PURPOSES.

BY

JOHN CHARD,

ASSISTANT IN THE LIVERPOOL MUSEUM.

IN 1883 the Committee of the Library Museum and Art Gallery of Liverpool, made a suggestion to the School Board of the town with the view of utilising some of the duplicate specimens in the Museum for the purposes of teaching in Elementary Schools. This suggestion was so cordially received by the members of the Board and its officers, that the Chairman of the Museum Sub-Committee at once set about considering the best means of making the specimens most useful to Schools. At first it was thought that a small collection of objects might be given to each School, but this idea was abandoned for various reasons which are stated in Mr. Higgins' memorandum at the end of this paper. Finally it was determined that a Circulating Cabinet Collection should be formed and that this should pass from school to school.

A printed list was obtained from the Clerk of the Liverpool School Board of all the Board and Voluntary Schools included within the Parliamentary Boundaries of the City, and a printed octavo pamphlet or "Memorandum" (Appendix A), written by the Rev. H. H. Higgins, M.A., was forwarded for the acceptance of the teacher in each department of all the Schools on this list: the Schools being 106 in number.

The Memorandum was accompanied by a note inviting each teacher to attend an evening meeting, on the 12th of February, 1884, in the Lecture Room, "to consider the best method of carrying out the objects of the proposed Circulating Museum."

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This meeting was well attended by Masters, Mistresses, and Teachers; and specimens, suitable for the purpose in view, were exhibited and examined. Addresses on the subject in hand were delivered by the Rev. H. H. Higgins, Mr. E. W. B. M. Hance, Clerk to the Liverpool School Board, and others, and discussion invited.

This was well responded to, the proposal approved, and the offer of such duplicate specimens thus set apart was cordially received; and finally, a Committee, consisting principally of Teachers, was appointed to discuss with the authorities of the Museum the practical working out of the scheme.

The Teachers Committee met from time to time, and a printed circular letter of enquiry was sent to every teacher. In response to this circular replies from 64 Schools were received by the date appointed, all in favour of the proposed circulating collection. In almost every case the Head Master promised to take charge of the Cabinet.

The principle of the proposed Circulating Collection having been thus favourably received, the Rev. H. H. Higgins, Mr. Moore, Mr. F. P. Marrat, Mr. R. Paden and myself, devoted as much time as possible to the selection of specimens and to the devising of suitable means for their conveyance, protection and display,

When these arrangements were well advanced, an evening meeting, to which all the Teachers who had favourably responded were invited, was held in the Museum on the 22nd of April, 1884, and progress reported.

It was announced that the 64 Schools which had accepted the proposal had been marked out on a Map of Liverpool, and a dividing line fixed giving 32 Schools to the North Division and 32 Schools to the South Division.

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The Collections, as far as prepared, were exhibited and approved, as was also the proposed method of distribution. When finally completed the Collections and the proposed arrangements were submitted to the Library and Museum Committee, on the 24th of April, 1884, and received their sanction and approval.

It was found that only Sixteen Boxes or Collections could be immediately got ready, but others would be added from time to time. These Sixteen Collections were to be sent to Eight Schools in the North and Eight Schools in the South, selected from those situated nearest to the Museum, and after remaining a month, were to be collected, brought back to the Museum, examined, and re-issued for a month to Eight more Schools in each division, and so on continuously during school terms.

These Collections were first sent out in May, 1884, and are still being re-issued in each month, equally divided, to the various schools in their respective turns.

The total number of Schools now registered, North and South, amounts to upwards of 70, and we are still receiving, from time to time, applications for a place on the list.

The number of Schools registered on our lists for the South District are as follows:—

35 Elementary and Church Schools and
2 Teachers' Training Colleges (Mount Pleasant and Durning Road), making a total of 37 in all, in this total number there are 8 Board Schools.

The number of Schools registered for the North District are as follows:—

33 Elementary and Church Schools, and in this total there are 11 Board Schools.

The number of Cabinets now in circulation is twenty-three, and an extra Cabinet is prepared to illustrate Mr.

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B. B. Woodward's Penny Hand-book of Shells. (Published by Swan, Sonnenschein & Co.) This does not go out with the circulating ones on account of containing such a vast number of shell specimens, but is well adapted for taking to Soirées, Young Men's Associations, &c. Other Cabinets are in course of preparation, viz:—Nuts and Seeds, Dyes and Tans, British Shells, Building and Ornamental Stones, Woods, etc.

Besides the above, we have a few small Loan Collections to meet applications received from Teachers and others who are desirous of more fully illustrating lessons to be given before the Government Inspector, at the annual examination. The object of the Circulating Museum is to help the children to follow the lesson by letting them see actual examples of the things of which the Teacher is speaking. That the shewing of specimens *does* interest the children is abundantly proved by experience. The promise to exhibit a Cabinet to the children, and give a lesson upon it, never fails to secure a large attendance. Many Teachers have assured me that the attendance on some days (especially in the poorer parts of the city) would be very small but for these Cabinets.

The method of distribution is as follows:—
A light spring van (covered), holding eight, ten or twelve Cabinets, accompanied by myself and one of the Museum Attendants, is taken to the North Division, leaving the Museum about 9-45 a.m., returning about 12-30 p.m. About 2p.m. we start with the remaining eight, ten or twelve Cabinets for the South. A Parcel Book with all the particulars entered in it accompanies these cases, and when we arrive at a School a brief explanation of the contents is given to the Master or Teacher who receives the box: in return we receive his or her signature as to the condition of the specimens.

During the six years of their circulation the amount of damage has been very slight indeed, considering the very

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awkward and poor accommodation some of the Masters have for the Cabinets. Strange to say it is only within this present year (1890) that any damage has really taken place, such, for instance, as the breaking of a shell or a piece of coral, and these, when mended, were not seriously damaged by the accident. One or two of the glass shades which protect the stuffed Birds and Fish got accidentally cracked or broken, not by the Masters or Teachers, but by persons cleaning the Schools, and they may not have been to blame, as they probably did not know what the Cabinets contained. In every accident that has occurred the Master or Mistress has been very willing to pay for the damage done.

In some schools I fear that the Cabinets are not used quite so often as they should be, whilst in others they would be very glad to receive one every month.

It takes, on an average, about *three months* before each School receives its turn again for another box sometimes a little longer on account of the holiday terms.

In conclusion I may be allowed to say a few words in favour of these Collections. Now that the value of the study of Natural History, as a branch of mental training, is beginning to be understood, we may fairly hope that some of the most interesting departments in Zoology will attract many young minds, and that these Circulating Collections may contribute towards fixing accurate ideas of Natural History. The Rev. H. H. Higgins, the Committee and the principal officers connected with this Museum, will then have their reward.

I have appended a list of Collections already in circulation, and also of Collections in preparation.

These Cabinets are now to be seen in the Great Hall of this Museum, and every information will be given during this meeting to any person interested in the subject.

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The Rev. H. H. HIGGINS spoke of the success of the school cabinets, attributing much of that success to Mr. Chard's own skill and energy.

Mr. CAMERON said that among the many advantages that would arise from the system, one of the greatest would be the encouragement of school children in forming museums of their own. But a certain amount of science teaching should be made compulsory in all elementary schools.

Mr. McMILLAN spoke of the scheme as one of the many plans adopted at Liverpool for popularizing science, plans which had been, on the whole, singularly successful.

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APPENDIX A.

CIRCULATING MUSEUM FOR SCHOOLS AND OTHER EDUCATIONAL PURPOSES.

The following Memorandum was read before the Sub-Committee of the Liverpool Museum and Mayer Collection, by the Rev. Henry H. Higgins, Chairman, at a meeting held on the 8th January, 1884.

At a meeting of the Liverpool School Board, held in December 1883, a communication was made from the Committee of the Library, Museum, and Gallery of Art, inquiring if duplicate specimens in the Museum could be used for educational purposes in connection with the Liverpool School Board.

The scheme was cordially entertained by the Board, and subsequently a letter was received by Mr. Moore, Curator of the Public Museum, from Mr. W. Hewitt, B.Sc.. Science Instructor, mentioning a number of natural history specimens likely to prove serviceable to teachers in giving object lessons.

My first impression was, that a small series of natural history objects might be given to each school; but this idea was relinquished, chiefly for two reasons :—

1.—In case of many applications for collections being received, the specimens granted must necessarily be small and of inferior character.

2.—The collections being of little value, and remaining without alterations or additions, would probably before very long become neglected and wasted.

These considerations turned my thoughts towards the establishment of a circulating museum, the practicability and utility of which form the subject of the following Memorandum :

The peculiarity of the scheme may be said to be based upon the recognition of a capacity in the children educated in elementary schools to be interested and delighted with objects of beauty or skill with which they are unfamiliar. This capacity is shared by all ages and ranks. A crystal vase in a drawing room at length attracts little admiration from its owners, but fills with enthusiasm a stranger guest. The failure, in schools, of series of objects which have been extensively made up and sold as grammar collections, has risen mainly from the large number and *insignificant individuality* of the specimens. In the case of 100 children assembled in the gallery of a class-room, it would be comparatively easy to rivet and sustain their attention during a lesson on an object of fair size and striking form, combined with beauty of colour and texture, the like of which they had never seen before. A specimen of

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considerable excellence, say a mineral or a shell, will not only assist the teacher in firmly implanting the instruction he wishes to give on its geographical distribution, place in nature, and economic applications, but the beautiful and uncommon thing itself, if sent amongst children to be handled with care, and felt, and looked at closely, will, I am firmly persuaded, exercise a good moral and refining influence on some of them. A piece of quartz as big as a walnut, or the shell of *Helix aspersa* from any old garden wall, would probably fail to serve the same purpose, not from any fault in the children or the teacher, but simply because it would not appeal to the same natural capacity for admiration, which would therefore be left unexercised.

Such are some of the considerations pointing to the establishment of a circulating museum, the character of which may be suggested by the use to which it is to be applied :—

1.—It should be chiefly confined to groups, each limited to a single department in natural history, order being the main feature in Nature.

2.—The group should not consist of many specimens, probably of not more than 20. It is thought undesirable to continue the object lessons on one group for a longer period than two months, in which time 15 or 20 specimens may be well illustrated, and application be made for another group.

3.—A central depôt would be required for the groups. If established at the Public Museum, the distribution would be arranged under the superintendence of the Curator, Mr. Moore.

4.—Receptacles, each with lock and key, would be required for the conveyance and preservation of the groups.

A beginning might be made with a few groups consisting of type specimens of very large departments in nature—1, vertebrate animals; 2, animals without bones; 3, plants; 4, fossils*; 5, minerals. These groups include everything suitable for an object lesson, and must therefore always remain as the fundamental groups. But it may practically be found more convenient to start with a further division of some of them. Thus, from the vertebrate animals might be segregated a group of such as suckle their young *(Mammalia)*. The enormous series of boneless animals might form two groups, animals with jointed limbs, *(Arthropoda,)* being set apart from the rest. Metals and metallic ores might be divided from other minerals. A supplementary series might be added for advanced classes, consisting of such groups as might illustrate anthropology, with its divisions ethnology and archæology. The teacher might be left to exercise his own discretion in giving a lesson from two or even more objects at a time—points of difference or resemblance constituting almost the entire sum of our knowledge —but the apt teacher will be careful to preserve as long as possible some unseen treat in store.

*It has been determined, where possible, to send a few typical fossils with each group.

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Where the teaching on the groups has been efficient, the sight of larger collections will be found indispensable. The Liverpool Museum is free to all during five days in the week; but to ensure the largest amount of advantage to classes from schools, the visiting party, under the supervision of the teacher, should not consist of more than twenty scholars. The visit should be made, if possible, at a stated hour known to the Curator, but by no means on a closed day—Friday. The visit should be made not for the purpose of passing rapidly through the rooms, but to a particular part—to some special table case, or, at the utmost, to two contiguous table cases; to the wall cases in some room, or half a room; or to some 20 or 25 feet of the cases in the gallery, the teacher and his class to remain in the selected department during the whole of their visit. If the visit be made under such conditions, the officials of the Museum would be instructed to prevent the interruption of the teacher and his class by ordinary visitors. The teacher and his pupils would, in fact, have the selected department to themselves for any time not exceeding one hour.

I may be permitted to urge that such visits, together with the necessary time for going and returning, should in every respect reckon as attendance in school.

The specimens recommended for object lessons are not costly rarities, but each should be good and perfect of its kind; six or eight inches in length, where such a size is ordinary; not exceedingly fragile, yet all the better if requiring respect and care in being handled by the children. Such objects as the bees, locusts, king-crabs (*Arthropoda*), a stuffed bird, or the skeleton of a small vertebrate animal, &c., might be given for examination to the class, each enclosed in a glass-capped box.

Teachers and children should be encouraged to bring to the object lesson specimens of their own for comparison with the type specimens, care being taken, during the lesson, to avoid the introduction of objects foreign to the group.

Although the most desirable objects are such as possess conspicuous beauty, this quality alone will not enable the teacher profitably to occupy with them his lesson time. In every possible case the interest of the specimen should admit of being humanized—associated with man, his history, his necessities, his discoveries, his tastes. The teacher's aim should be similar to that of Mr. Huxley in publishing his lectures on Physiography—to build up a connected knowledge of common things.

If I might differ from so distinguished an authority, I would call in the aid of vivid sensuous impressions, not last but first; such being Nature's own way of teaching. Mr. Huxley would begin with familiar objects, which are not strikingly attractive, and then proceed to things further of. My effort would often be made in the opposite direction.

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For example: I would take the large and beautiful exotic shell, *Pinna*, with its byssus of glossy silk, and the fashionably-coloured gloves made of this material, and, after operating with these, would require the class to bring a large cluster of common sea-mussels (*Mytilus edūlis*), and would make the children find the silken byssus, at the same time telling them that the bridge of Bideford, on the Devonshire coast, exposed to a tide so strong that the walls could not be kept in repair by mortar, was protected by a coating of common sea-mussels first brought to the place in boats.

The kind of group most appropriate to form the topic of a set of lessons in any school has yet to be learned by experiment. In the crowded districts of the lower parts of Liverpool, probably, no object would more effectually open the eyes, and through them the ears and hearts, of boys and girls than the green mossy nest and turquoise eggs of the hedge-sparrow, which would excite little curiosity in the schools of rural districts.

In conclusion, I am constrained to remark that the benefit of the whole scheme must rest upon the cheerful co-operation of the teachers, and that the circulating museum is commenced quite as hopefully in behalf of the teachers as in behalf of the children. The field is one which is likely to contribute something to cheer the hours and brighten the lives of all who are engaged in giving instruction. I do not affirm that the children are already taught too much; but with a confidence which has never swerved, in the wisdom of my old master, Pestalozzi, I suggest to school boards, high and low, that the teaching is out of all proportion in excess of the training, the latter being with difficulty weighed in the scales of school examinations. The object of the circulating museum is not so much teaching as training; not so much the inculcation of facts as the illustration of the happiness to be obtained through habits of observation.

There is a time coming when the unity of nature, of which, evolution, however true and grand, is but one imperfectly understood aspect, shall be assimilated by all cultivated minds; but at present science is driving the love of Nature for Nature's own sake out of the field. Private collections are failing in Liverpool and all around; and teaching is everywhere hard, and hardening in its results.

Such is the state of things in which Sir James Paget, only the other day*, asserted the curative properties of "Recreation by Wonder,"—of healthy spontaneous admiration—not waiting to learn the name of the artist before venturing to praise the picture—free as the breaking of the woods into song in the dawn of a spring morning. Scarcity of original research, forsooth? Are

*Nineteenth Century for December, 1888.

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there not in nature countless fields for research. original enough for the millions that never have the chance to be recreated in them, whether they be the teachers or the taught, and reminding us of the promised harvest, in which both he that soweth and he that reapeth, the teacher and the scholar, shall rejoice together.

H. H. HIGGINS.

APPENDIX B.

FROM REPORT ON THE PROGRESS OF THE CIRCULATING MUSEUM COLLECTIONS, BY MR. THOMAS J. MOORE, CURATOR.

JUNE, 1884.

The collections were sent out for the first time on the 6th of May, 1884. They were collected again on the 3rd of June, examined, found in perfect order, and were re-issued on the 5th June.

The first visit of inspection by the Rev. H. H. Higgins, accompanied by Mr. W. Hewitt, B.Sc., Science Demonstrator to the Liverpool Board Schools, and the Curator, was casually made on the 27th of May to several of the schools which had received Collections; and satisfactory results as to their appreciation and use were duly reported by Mr. Higgins to the Library and Museum Committee.

On the 21st of June the first annual meeting of the National Association of Science and Art Teachers took place at the Liverpool Institute.

In the morning a visit of inspection was made to the Free Public Museum and Walker Art Gallery.

In the evening a meeting of the Association was held in the Government School of Art, and at its close eight of the Circulating Collections were laid out for examination. The Honorary Secretary, Mr. Hewitt, thus reports thereon :—

> "The general opinion was that the plan was excellent and "calculated to do a great deal of good in the schools. I "took Professor Sylvanus P. Thompson, of University "College, Bristol, who presided at our meeting, specially to "see the cases, and he was very pleased with them, and "especially remarked on the excellence of the specimens."

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The President of the National Association of Science and Art Teachers, Mr. A. Norman Tate, writes as follows :—

"The Collections for distribution amongst the Elementary "Schools evoked much favourable comment."

It may also be mentioned that at an early stage of the movement Mr. Heneage C. B. Harrison, one of Her Majesty's Inspectors of Schools in Liverpool, inspected the arrangements for the School Collection and was very favourably impressed with them.

The following is a brief description of the boxes, or, more properly, Cabinets, containing the specimens; of the method of packing and display; with a summary list of the various Collections appended.

The Cabinets are of the plainest possible character. They are made of deal, and have a hanging-down handle on each side by which they may be most conveniently carried and kept upright.

They are bound with small black metal clasps, and are stained on the outer side with a suitable brown colour showing the grain of the wood, and varnished, so as to be fairly presentable objects.

Each Cabinet opens in front by a hinged hanging lid, secured by a small padlock conveniently placed at each side.

Within, the Cabinets are regularly grooved, top and bottom or right and left, for sliding shelves or upright divisions as required.

Two standards of sizes have been adopted, as follows :—

For Vertebrates ... 32 inches long, 17 inches high, 16 inches deep.

For Invertebrate and all other objects } 17 " " 17½ " " 12½ " "

The sliding shelves or trays, all of uniform size in the Cabinets for Invertebrates, &c., have a raised inner border to prevent the boxes placed on them from slipping off in handling.

A scheme was designed of sizes for small rectangular boxes to contain the specimens, and to fit easily within the inner borders of any of these trays.

The lower part of the boxes is of the uniform height of one and a half inches. On these fit freely loose lids or covers of two or three scales of height to suit the specimens.

The covers for Insects, Crustacea, and light objects have glass tops.

These boxes are made of thin light wood for the heavier objects, and of cardboard for light specimens. Within they are white; without they are covered with neat dark-coloured papered linen, such as is used by bookbinders.

Horizontally they fit compactly on the trays, and vertically with little or no loss of space.

With care in placing and fixing the specimens in these boxes little or no packing is required for travelling, thus saving much time in examination and preparing for conveyance.

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The arrangements above described greatly facilitate display. The trays are readily drawn out of the cabinets, and the contents of those with glass-topped boxes are at once fully seen.

The easy fitting of the lids of the others facilitates ready display of these also; and many of the objects can be *handled* and examined if necessary.

One or more specimens may be contained in each of these boxes; all are conspicuously numbered, and a corresponding list with the names and country of each object is affixed to the inner face of the hanging lid of the cabinet, to face the spectator when open.

The boxes bear on the outside the same reference number as the specimens within; and the position of each box on its tray is similarly numbered, so that every box may be kept in its place or easily returned to it.

Each tray is also marked with a letter to correspond with the groove it should run in, and which is similarly lettered.

For the Vertebrates different arrangements were requisite, and larger Cabinets.

For the Fish two glass cases were made of the full internal width of the cabinet from left to right, and so much less than half the internal height as to admit of the two cases being easily moved in or out of the Cabinets—the lower case resting on the floor, the upper one on a sliding shelf.

Each glass case had the four sides and top of glass neatly held together with black tape, papered and varnished, fitting closely to an ebonized stand. The glass frame could be lifted off, and each specimen used separately before a Class by lifting it from the peg holding it to its position on the ebonized stand.

The Cabinets for Reptiles was arranged similarly to that for Fishes.

The Cabinet for Birds was divided into two by an upright partition sliding in grooves. In one compartment a glass case made like the above, but tall instead of long, moved easily in and out. Within were six neatly stuffed birds. The other compartment, divided horizontally in two by another sliding partition, had, below, three bell-glasses each containing a nest and eggs, and a fourth containing a skeleton; above, on the sliding shelf, were fixed feet of land and water birds, &c.

The Cabinets for Mammals was also divided by an upright partition with an upright glass case moving in and out of one compartment and containing four stuffed specimens, each removable like the Birds, Reptiles, and Fish for single object lessons. The other compartment was filled with boxes of the kind used for the Invertebrates, and containing skulls, horns, feet, &c.

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As with the Cabinets for Invertebrates, &c., *no packing material* was required for the safety of the glass in transit, nor was any requisite to protect the specimens.

Safety of all the Collections, with ordinary care, has been so far obtained *by the methods of fixing the specimens;* by easy, *but not too easy*, fitting of boxes, shelves, and cases; and finally, in transit, by sending the Cabinets in a light spring van by trusty guardians, responsible to the Curator.

LIST OF COLLECTIONS.

2 Cabinets containing Metals: 22 specimens; including model of gold nugget.

2 ,, ,, Coal: 25 specimens; including varieties of coal and coal-plants, transparent section of ditto, recent sphagnum, peat, and clubmoss.

1 Cabinet ,, Rocks: 34 specimens.

1 ,, ,, Polished Stones: 30 specimens.

1 ,, ,, Corals and Sponges, No. 1: 17 specimens; including toilet sponge, fossil sponge; recent and fossil corals, and glass model of sea anemone.

1 ,, ,, Corals and Sponges, No. 2: 18 specimens of sponges, corals, and corallines (*Gorgonia*).

1 ,, ,, Starfishes and Lower Forms: 26 specimens; including starfishes, sea urchins, sea cucumber, (Trepang), "Aristotle's lantern" of echinus, Venus's flower-basket, glass-rope sponge, &c.

1 ,, ,, Shells, No. 1: 28 specimens, including conch shell, ear shell (*Haliotis*), scallops, cowries, clams, stone and wood borers, Ammonites, &c.

1 ,, ,, Shells, No. 2: 23 specimens; including nautilus, *Pinna* and byssus, tree oysters, pearl oysters, and borings of ship-worms or Teredos.

1 ,, ,, Shells. No. 3: 24 specimens; including rainbow ear-shell, olive and cone shells, scallop shells and fossils (*Ammonites, Productus, Orthoceras*), &c.

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1 Cabinet containing Crustacea: 23 specimens; including barnacle and acorn shells (*Cirrhipeds*), land crab, spider, masked, hermit, and other crabs, crayfish, Norway lobster and *Limulus* (horse-shoe crab).

1 ,, ,, Insects and Allies: 23 entries; including scorpion, centipedes, spider (giant), wax and cochineal insects, atlas moth and cocoon, leaf insect, mantis, locust, box of British moths and box of butterflies.

1 Cabinet to illustrate Shells and their uses.

1 ,, ,, Palms.

1 ,, ,, Gums, Shellac, Rosin, Wax and Paraffin.

1 ,, ,, Ethnology.

1 ,, ,, Textile Fabrics.

1 ,, Shells arranged to illustrate Mr. B. B. Woodward's Penny Hand-book of Shells, published by Swan, Sonnenschein & Co.

List of Cabinets in preparation—Nuts and Seeds, Dyes and Tans, British Shells, Building and Ornamental Stones, Hairs and Bristles, Woods, etc.

None of the above Cabinets exceed 17 × 17½ × 12½ inches.

The following Cabinets measure 32 × 17 × 16 inches.

1 Cabinet containing Fish: 15 specimens; including a fossil fish, stuffed dog-fish, angler fish, (young), climbing fish (*Anabas*), gurnard, perch, &c., egg case, shark's jaw and vertebræ. and beak of saw fish, in two glass cases.

1 ,, ,, Reptiles and Amphibia: 11 specimens; including snake and cast skin, tortoise and eggs, young turtle and eggs, young crocodile, lizard, chameleon, frog and skeleton, in two glass cases.

1 ,, ,, Birds: 13 entries; stuffed owl, hawk, robin, wren, thrush, and blackbird, in glass case; eggs and nest of thrush, blackbird, and hedge sparrow, and skeleton of thrush, under bell glasses; head of vulture, feet of swan, ptarmigan, &c.

1 ,, ,, Mammals: 15 entries; including muff monkey, hedgehog, rabbit and squirrel, stuffed, in glass case; skulls of lion and cat, skeleton of mole, horn of buffalo, polished horns of spring-bok and roe deer, foot of lion, deer, &c.

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NOTES ON THE LIVERPOOL FREE PUBLIC MUSEUM.

BY

THOMAS JOHN MOORE,

Corresponding Member of the Zoological Society of London;

CURATOR.

THE best service that I can render to the newly formed Museums Association seems to me to be this, to give some brief outline Notes on the History of the Museum in which we are now assembled, and known collectively under the above title, or, more briefly, as the Liverpool Museum.

The polished slab of granite over the front entrance bears the following inscription: "This building, containing the Free Public Library, Museum, and Gallery of Arts, including the Museum of Natural History presented by the Earl of Derby, was erected, on a site provided by the Corporation, at the sole cost of William Brown of Liverpool, Merchant, and by him presented as a free gift to his fellow townsmen, October 18, 1860."

Thirty years ago when this inscription was made it fully and exactly stated the case. It is now altogether inadequate. The Mayer Collection of Historical Art and Antiquities has since been housed within its walls; and the Walker Art Gallery, the Picton Reading Room and Rotunda Lecture Hall have been erected.

The Natural History Collection was formed at Knowsley, by Edward, thirteenth Earl of Derby, who was born in 1775, succeeded to the title and estates in 1834, and died in 1851.

Throughout his life he was an ardent Naturalist, surpassing others in the extent of his collections, both living and dead. He was President of the Linnean Society, was one of the founders of the Zoological Society, and was for many years President of that Society also.

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At the sale of the Menagerie and Aviary, shortly after his death, the number of living objects recorded in the Catalogue drawn up by myself was as follows—

			Of which were Knowsley bred.	
	Species.	Individuals.	Species.	Individuals.
Total number of Mammalia	94	345	39	207
,, ,, Birds	318	1272	45	549
Total	412	1617	84	756

To obtain these creatures he not only bought largely from dealers, but employed many persons to collect for him specimens, living or dead. He sent an Expedition for three years to South Africa; he sent for many years in succession a collector to the Niger and Senegal, resulting in the discovery of probably the largest Antelope living, the *Oreas Derbiana*, or Jinge Jonga, striped like the Koodoo but with horns like the Eland, which it seems to excel in size, and of which I know of no skins but those thus obtained and now in this Museum.

He sent two Expeditions to Honduras for living examples of the *Meleagris ocellata*, or Peacock Turkey. These Expeditions resulted in the discovery of the *Oreophasis Derbiana*, or Horned Pheasant, and that of the *Chauna Derbiana*, a new species of Screamer. At the time of his death his correspondents and collectors numbered over 30 individuals in the Old World and the New. He had long been a liberal purchaser from the continental and home dealers, as well as a patronizer of Bullock's and other Auction Rooms, and obtained many specimens from Latham and the older collectors. From Gould he had examples of nearly all the species of Mammals, Birds, &c., collected by him and Gilbert in Australia and Tasmania. Also collections made in the Philippine Islands, in South America, in New Zealand, in South Africa, in Abyssinia, and in North and West Africa, by various eminent travellers and collectors.

The Collection, when removed from Knowsley, numbered over 18,000 Birds, 1200 Quadrupeds and 300 Reptiles and

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Fish, the greater part of which were stuffed. The Quadrupeds, especially the larger ones would have been more numerous but for the liberal donations made to the Zoological Society and to the British Museum from the extensive collections made by the Expedition sent to South Africa.

Among the most noteworthy objects may be mentioned the first specimen of the *Apteryx australis*, the original specimen described by Dr. Shaw in 1812, and the first example brought to Europe, as well as the type of *Apteryx Mantelli*, described by Bartlett, and other types described by Sclater, Fraser and others. Also one of the finest known eggs of the Great Auk or Gare Fowl, *Alca impennis*; three specimens of the Labrador Duck, *Kamptorhynchus Labradorius*, believed by Professor Newton to have been exterminated some 40 years since, an example of the White Notornis (*Notornis alba*), and of the Philip Island Parrot, (*Nestor productus*), also supposed to be extinct.

In accordance with the wishes of the Founder, the preserved collection was offered by his successor to the Town Council of Liverpool, and by them accepted. To carry out the arrangement, and to provide for the maintenance of the newly formed Free Library, as well as the Museum, an Act of Parliament was applied for and passed in the Session of 1852, settling the Museum on Trustees, and authorizing the levying of a rate not exceeding a penny in the pound on the rateable property of the Borough.

A spacious building, the Old Union News Room, at the corner of Duke Street and Slater Street, was purchased for the housing of the Library, and was enlarged to receive the Derby Collection. Four rooms on the upper floor were fitted-up with cases, chiefly from Knowsley, and two rooms on the basement with new ones. The large model of Liverpool (50ft. by 8ft.), and the Collection of Liverpool Imports, which together formed the contribution of Liverpool to the Great Exhibition of 1851, comprised, with trifling additions,

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the whole of the exhibition during the years intervening between 1852, when the Collection was removed to Liverpool, and the opening of the present building in William Brown Street, in 1860. At the direction of the Library and Museum Committee, I, as Curator, presented a Report on the fitting-up of the New Museum with Cases for Vertebrate specimens and the Rev. Henry H. Higgins, M.A., by request, presented a Report on the best method of preparing for, and displaying, such a collection of Invertebrates as would be worthy of the new Institution.

These Reports were approved, and acted upon in due course, with results now seen; the chief additions being the erection of large Wall Cases and Balustrade Cases for Fossils, Minerals, and large Corals, in the Great Central Hall, also the covering in of an enclosed space, reserved for future extension, but immediately used as a Gallery of Art and Inventions, which, failing in its purpose, was devoted to the reception of the vast and most valuable Collection of Art Antiquities presented by Mr. Joseph Mayer, F.S.A., in 1866.

The designs of all the Natural History Cases for the new building were made as simple as possible, and were not fettered by precedent. For instance, all the wall cases have glass tops. This novel and simple precaution insures the fullest amount of light, and conduces greatly to the clearance of dust, any lack of periodical cleaning being at once open to detection. Each door of the cases is separated into three divisions with two horizontal metal bars and three ample squares of glass in height, which, in most instances, serve as picture frames to as many groups as come within easy range of inspection. Simple but special methods of fastening against the entrance of dust have been adopted, and *full* command of the interior is ensured by the use of movable shelves and iron bearers supporting them.

On the whole the methods adopted have been successful, and have been frequently inspected by Architects and Designers on behalf of provincial and foreign institutions.

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The Table Cases were fully thought out, and ample details respecting them are given in the hand-books on sale in the building. These will be fully explained and supplemented to any one desirous of being further informed. It may be mentioned that the most frequent enquiries are made respecting the precautions against moth and dust, to which the answer is simple, *pay for good material and good workmanship*, and study well all matters of construction and detail. The result will generally be satisfactory, and what is more, will *deserve* to be so, but the giving out of contracts to the lowest tender is open to very doubtful issues, and cannot be entered upon with too much caution.

Sir J. A. Picton, Chairman of the Library and Museum Committee, (from the first inception of the Institution to his lamented death in 1889), when he first gave instructions on museum matters, impressed upon me that "whatever is to be done should be done *well*," and from this rule he never swerved.

The new Museum being erected, the general disposition of the arrangements decided upon, and the several kinds of cases constructed, the collections were speedily got into place. The Mammalia occupied first three, then all five rooms of the principal floor; the Birds first four and then all five of the rooms on the upper floor, immediately over the Mammalia; and later two similar rooms continuing the series on the upper floor on the East side of the Great Hall, were devoted to Reptiles, Amphibia and Fishes, and to purposes of study connected therewith.

Twenty Table Cases of uniform dimensions, one half with cabinets beneath and one half without, were devoted to the Invertebrata, and are fully described by the Rev. H. H. Higgins, in the exhaustive *Synopsis of Invertebrates*, of which a second edition by him is on sale, as also two separate guides on distinct plans, for untrained visitors; one of these guides gives interesting and valuable information on

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"Animals without Bones," (the great characteristic of the Invertebrates), and the other contains plans of Wall and Table Cases, and clearly indicates, in an orderly manner, the several contents, of each room and gallery, whether Vertebrate or Invertebrate.

The space at my disposal will not allow ot my commenting on more than a very few of the objects contained in the Museum. Let us attack them, as the ordinary visitors do, in the ascending order of Nature itself, fortunately and conveniently guided thereto by the current of visitors setting in through the Great Central Hall (devoted on the ground floor to Statuary and on the upper floor to Geology), entering the rooms on the right hand and proceeding onwards. These rooms have the *Table Cases* devoted to a systematic display of Invertebrates, in 240 alliances from the lowest living organisms. Each Table Case contains twelve trays of uniform size, six on each side of a central upright compartment and leading on to similar trays in the next Table Case.

The new rooms being fitted-up, and the Wall Cases being largely occupied with the Derby Collection, specimens began rapidly to flow in both by gift and purchase. Many contributions were added by masters of ships and others, stimulated thereto by appeals and instructions drawn up by the Curator, printed in the Proceedings of the Literary and Philosophical Society of Liverpool for 1862, and circulated among the Mercantile Marine. Many of the most successful of these captains were made Associate Members of the Society, and numerous references to their collections, notes and observations may be found in the Proceedings of that Society.

Captain J. H. Mortimer, an American captain, invented an admirable method of transporting small living Marine and Freshwater objects by sea in ordinary fish-globes, suspended like cabin lamps and swinging as freely. These served splendidly as feeders to our Aquarium room, to which Fish, etc., have been

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brought from the United States, from Brazil, the West Coast of South America and from distant places in the Eastern Hemisphere; notably also young Sturgeons from Hamburg. America has had its reward, for far larger proportionate successes have attended consignments of *living Soles* to the States by these Aquaria, than by any other method however large the scale.

Liverpool men began to take pleasure in making contributions involving much personal labour and expense. The late Mr. H. Heywood Jones, of Larkhill, contributed Conies and Birds of Palestine, Goral and other Antelopes from India, and various smaller Mammalia from America; Messrs. Bowring, a splendid series of Seals from Newfoundland; Mr. Henry Duckworth, a fine Gorilla and skeleton, from the Gaboon; Mr. R. B. N. Walker, a young specimen of the Gorilla, and Fishes, etc., from the same region; Mr. St. George Littledale, large Game from the Far-West of America and from Central Asia, notably the Rocky Mountain Goat, from Alaska, and the renowned *Ovis Polii* from the Pamir, beside valuable contributions from the Caucasus, and Tusks, etc., of the Mammoth, from Siberia; Mr. P. H. Rathbone obtained some valuable fossil Mammalian remains from the Argentine Republic, and examples of the rare Cetacean, *Pontoporia*. Examples of the rare and singular allied Cetacean, the Susu (*Platanista Gangetica*), of the Ganges. Also a splendid wild example of the Yak, *Poephaga grunniens*, presented by Major Edmund Smythe, 13th Bengal Native Infantry.

Reference may also be permitted to the introduction of *Osteological specimens, side by side with mounted and stuffed examples*, a Liverpool method, and one that does much to popularize the study of osteology. This is further stimulated by the comparative series of limb-bones, hands and feet and skulls, first attempted, but on a much larger scale, by Professor Flower, at the Museum of the Royal College of Surgeons, London.

The Geological Collection originated in the purchase from Mr. Edward Charlesworth, of a large series of Crag and other Tertiary Fossils obtained by himself, and many Saurian and other

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remains formerly in the possession of Dr. Mantell. A large series of Fossils and Casts including remains of the great Tortoise (*Colossochelys atlas*) *Sivatherium*, *&c.*, from the Sivalik Hills collected by Dr. Falconer and Sir P. T. Cautley was presented by the Hon. East India Company. To these have been added Local Fossils from the Ravenhead Cutting collected by the Rev. H. H. Higgins, Collection of the Post-Glacial Geology of the District by Mr. Mellard Reade, Bear Skull from the Bootle Dock Works, skull and horns of *Bos primigenius*, *Bos longifrons*, *&c.*, from the excavations for the Birkenhead Docks; the Austin Collection of Crinoids, the collection of Minerals formed by William Phillips, F.L.S. Considerable purchases have been made from time to time in all Departments of the Museum.

In 1876, Mr. Reginald Cholmondeley, of Condover Hall, Salop, chartered the large Steam Yacht *Argo* for a scientific expedition to the West Indies, and offered to take any deputation the Museum Committee might send. This generous offer was gladly accepted, and the Rev. H. H. Higgins, with two assistants, Messrs. Chard and Wood accompanied the expedition. The Yacht was absent about four months, and visited Madeira, several of the West India Islands and the Spanish Main, taking Philadelphia on the homeward voyage. The collections made, particularly of fishes, insects, crustacea, shells, corals, sponges, &c. were extensive, and formed a very valuable addition to the Museum.

A Basement Room measuring 50 feet by 27 was early devoted to Aquaria and Vivaria for Reptiles, Amphibia, Fish and Aquatic Invertebrates. It contains 7 large Tanks, 16 of medium size, and over 20 smaller vessels. One large salt water tank has been in continuous use for over 25 years without being emptied; fish have been kept for 10 years in the medium tanks and in a small bell-shaped glass vessel a blind cray fish (*Cambarus pellucidus*) has lately died, after 14 years' confinement therein, during which it cast its shell many times, and gradually reproduced its limbs from one half the normal number when first received to the full complement.

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The collection of Historical Art Treasurers, given to Liverpool in 1866, by Mr. Joseph Mayer, F.S.A., is one of the finest collections ever presented to a public institution. In some of its departments, those of Wedgwood ware and ivory carvings, it is unique. It contains the best collection extant of illustrations of Liverpool pottery ware, a manufacture for which the town was once celebrated, but which has long been extinct. In Egyptian and Assyrian antiquities it is very rich. The Faussett Collection of Anglo-Saxon remains forms a portion of it, together with a number of ancient manuscripts and illuminations.

A very considerable collection of Ethnological specimens is also included, to which many subsequent additions have been made.

The total number of visitors to the Museum from October, 1861, to December 31st, 1889, amounted to 11,530,159, giving an average yearly attendance for the 28 years of 411,798.

Marble Statues have been erected in St. George's Hall by the Corporation, in memory of the following benefactors, the Right Hon. the Earl of Derby; Sir William Brown, Bart.; Joseph Mayer, Esq., F.S.A.

The Rev. H. H. HIGGINS made some further comments on the Liverpool Museum and its contents, dwelling on the great value of Mr. Moore's work. He laid stress on Mr. Moore's efforts to promote a love for Natural History among seamen, the result of which was that many staunch and generous friends of the Museum were to be found among the mariners of the Port of Liverpool.

Mr. MARRAT added a few words on the arrangement of the Museum, and made especial mention of Dr. Zittel's named specimens of fossil sponges, which are now in the Liverpool Museum.

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THE BEST MEANS OF MAKING MUSEUMS ATTRACTIVE TO THE PUBLIC.

BY

R. CAMERON, J.P., SUNDERLAND.

The popular idea of a Natural History Museum is somewhat vague, and I fear often unfavourable. A Museum is, after all, but an epitome of the great living world outside. The infinite variety and multiplicity of things are, within its walls, reduced to order by Science.

The principles of classification have traced the relationship underlying the apparent confusion in nature, and placed her typical forms into groups which we show in our collections; but, after all, we must not forget that it is little we can do to show the endless variety of life in the living world around us.

The best painter may give us an Alpine landscape that can suggest what the real Alps are, but no painter can give us the mighty Alps themselves in all their grandeur of form and altitude. Nature herself is the great and wonderful reality. Our desire to know her mysteries, and modes of activity, is the true origin of Natural History.

The stored collection of natural forms in our Museums are there to represent the great in the smallest compass, and the apparent chaos of nature brought into order by the hand of Science.

Museums are intended to stimulate the instinctive desire for knowledge in Man.

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Museums hitherto cannot be said to have been popular institutions. Real Students are to be found there in increasing numbers every year. The local collector is there too, naming and verifying his private specimens. The collector of shells and insects will be found there also for the same purpose, but as to the crowd of casual and holiday visitors; what do they see and learn in a Museum? Even they must observe the beauty of bird and shell, and at least learn the elementary lesson that the forms of life are wonderful and endless, but the expression of their countenance indicates the vagueness of an ignorant mind, they are more bewildered than enlightened, any impressions made upon them cannot be lasting, because they are not based upon knowledge. The foundation of this popular ignorance is undoubtedly to be found in the absence of systematic study of Natural History in our elementary and other schools.

We are a practical utilitarian people, we prize knowledge very highly mainly because it is useful, but knowledge for its own sake, and for the sake of the mind, and the larger life it gives we care little for.

That this view of education should be held so largely among our commercial and political classes, shows how imperfect the popular view of our education is.

We have yet to learn in this Country that a man is more than a mechanic, that daily bread does not satisfy all his wants, that the laws of nature that surround him, that her phenomena which appeal daily to his senses, and the myriad forms of life before him are his inheritance and calculated to widen the range of thought; and that to die in ignorance when he might have knowledge is an immeasurable loss.

When our Educational Code recognises this truth, and insists that a knowledge of classification and of the technical language of Natural History is mastered in our Schools, then our Museums will be visited not by the few but by the masses of the people.

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The principles of classification are so necessary that no real scientific knowledge is possible without them. To be able to relegate a plant or animal to its proper Division, Order and Class, at sight, is no mean attainment. It is an education in itself. When you have reduced the apparent chaos without into order, you have done something more, you have disciplined the mental forces within as well.

Classification is necessary, if for no other reason than for giving us peace of mind. How a rational man can feel happy in a world with its endless variety of living things crowding in upon his brain is difficult to conceive. It is a necessity of our mental constitution that natural things be reduced to rank and file, that like must be placed with like, in order that we may properly know them.

Classification teaches us that all things are on a graduated scale, that Creation proceeds from simpler to the more complex forms of life.

Geology has made the wonderful revelation that the order in which life appeared in time corresponds, in the main, with our modern classification of the different departments of Natural History. Radiates, Molluscs, and Articulates first; the Fish, Reptile and Mammal follow, and Man comes last.

If the principles of classification were generally understood and taught in our schools, our Museums would become intelligible and interesting. It would not be a difficult matter to accomplish this in our public education. It only wants an order in Council to add the words "Classification of Animals and Plants, as far as the Divisions, Classes, Orders and Families, will be taught in all Schools under Government Inspection, in the 5th and 6th standards, and as far as the Genus in the 7th." The foundation for the true appreciation of a Museum and of the Natural History Sciences would thus be laid in the public mind. We can scarcely expect any

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general appreciation of our Museums until this is accomplished. If popular ignorance is to be undermined at all, it must be done in our Schools.

The young have a natural passion in this direction, it only needs training, and in one generation Natural History would become one of our most popular studies.

The scientific names attached to our specimens, often written in a crabbed and illegible hand, no doubt repel a large number of people who know nothing of Latin and Greek. I fear the mass of the people still look on our scientific terminology as unnecessary pedantry. "Why not give them English names?" is a very common remark. "If I see a flower and love it, what do I want with your pompous foreign name for it? 'A rose by any other name would smell as sweet.'" I need not point out to you the shallow fallacy underlying such remarks as these, but it is beyond any doubt that the language of Science is a repulsive barrier to many, because they do not understand it. The English name where possible should be given, in every instance, but people should know that these names are simply a necessity of Science, first for accurate description, and second for cosmopolitan use. This, however, is not a serious difficulty; I have known a man, who never read a line of Latin or Greek, in a few months master from two to three hundred roots of these languages, and thus put himself in possession of the key that unlocks the meaning of the majority of our technical terms. Our Elementary Schools could do this work with ease if the etymology of our composite language was made a necessary part of our English Grammar.

Arrangements of Museums.

Museums should be so arranged that the general visitor can easily follow the natural order of life, from the lowest to the highest. It should be apparent to him at a glance in what department he finds himself.

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The cases showing the Protozoa should come first, then Coelentrata, then Radiata, then your Articulata, then your Mollusca; and finally the highest forms of Fish, Reptile, Bird and Mammal.

The gradation of life, the order in which it appeared, would thus at once strike the mind of the visitor, and could not fail to instruct him, and awaken thought. Space is what is wanted to carry out a perfect arrangement. At present, owing to limited accommodation, Birds and Minerals, Molluscs and Insects, are often placed in most unscientific proximity to each other. A Curator, like other men, is compelled to adapt himself to conditions, but if a Museum has to be interesting its plan must be easily grasped by the mind.

Overcrowding.

The over-crowding of specimens is one of the commonest faults of Museums. There is a desire on the part of the Curator to show off his whole stock, and even his duplicates. This is an evil because it distracts and bewilders the mind of an ordinary visitor. It gives him the feeling that it is hopeless for him to master the names and characteristics of such a multitude of specimens.

The Curator should eliminate with an unsparing hand all the less important specimens, and keep only the best of the characteristic types of the families or genus, and these should be, as far as possible, isolated from other groups.

They should be mounted neatly and tastefully; the labels should be always printed, and each family should have a popular description placed in the case and also printed so as to be legible at a reasonable distance. Isolation of groups, taste and neatness in mounting, distinctness in naming and a popular description of the contents of the case, are the obvious conditions for making a collection attractive and

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instructive to ordinary visitors. It may be added that it is very desirable that all the cases should be handsomely finished, perfectly made, so to be dust-proof, and always with plate glass instead of a common kind.

Curator.

A first-class Curator is simply essential to the success of a Museum. If so much of his time is spent in his own room that he has become a mysterious and unknown personage to the public, the Museum will suffer; he should be at hand always, to answer questions, to show specimens, to take round groups of visitors, and be able to give short impromptu lectures. In fact a Curator and his staff should be the life and soul of the Institution. He should know everything and instruct every body, and be well paid for such important duties.

I have more than once gone through an immense collection of fossils and minerals in Paris, the only official I could find to answer a question was a policeman. If our aim is to instruct and create a popular taste for Science, we must act in a different fashion. My own idea of a Museum has always been that it should be made the head-quarters of all the Scientific activity of a district.

If Science Classes and Natural History Clubs exist, the Museum Manager and Curator should be leading spirits to direct and stimulate them.

Different classes of working men should be invited to co-operate, the Miner, the Quarry-man, the Stone-breaker and the Sailor should be invited to contribute to the Museum and thus secure their interest in its objects.

Hitherto the popular idea of a Museum has been that it was a sort of charnel-house for dead animals, skeletons and skulls; that it was a dungeon-like place, dark, dusty and dreary. This impression must be removed by bringing as much light, colour, and beauty within its walls as possible.

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A Museum can be made beautiful as well as instructive, if we show, to the best advantage, the gay plumage of tropical birds, the bright colouring of insects, the perfect form of shells, the light and beauty of crystals and precious stones, the idea that a Museum is a dull and uninteresting place would soon be banished from the public mind.

In conclusion I would only indicate another important element of success, viz.: explanatory and popular lectures during the winter months to the working classes, and I would only say here, as this subject has to be treated separately by Mr. Paden, that to this I attach the highest importance. Every Museum should have its Lecture Hall, and one or more Lecturers, who will teach without pedantry, and have the power to awaken, not the interest only, but the enthusiasm of their hearers, as they relate "the fairy tale of Science, and the long results of time," to audiences to whom for the most part they are a new revealation.

LIEUT.-COL. TURNER thanked Mr. Cameron for the practical advice contained in his paper, and pointed out the great usefulness of descriptive labelling and of demonstrations.

MR. MONTAGU BROWNE gave a sketch of the changes made in Leicester Museum, and pointed out the greatly increased popularity of the Institution that had resulted from these changes.

MR. OGLE complained of the neglect of common objects that was prevalent in Museums. He advocated the display of specimens of the Chemical elements (especially the commoner ones), and the abundant use of Charts and Maps, and recommended the exhibition of varieties of the commoner Birds and Animals, so far as space would permit.

MR. HOWSE bore personal testimony to the great improvement that Mr. Cameron had effected in the Sunderland Museum.

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Mr. McMILLAN strongly advocated the opening of Museums at nights and on Sundays, as a method of popularising them.

Mr. HOWARTH doubted the efficacy of late opening. He gave his experience of night opening at Sheffield, where it had been tried for a long time; the attendance was very scanty and did not seem to increase.

The Rev. H. H. HIGGINS stated that when late opening was first tried in Liverpool Museum it had to be abandoned in consequence of the turbulence of the visitors. The experiment was, however, repeated a few years later, and with success; the attendance being large and the visitors quite orderly.

Mr. CARR said that late opening had been tried at Nottingham with decided success.

Mr. BOWLEY said that he found the attendance at Sunderland Museum during the evening very poor.

The Rev. S. GASKING thought that the night attendance at Museums would be much better if greater efforts were made to make the Museums popular and attractive.

Mr. STORRIE said that the Cardiff Museum was open late on Wednesdays and Saturdays. It was found that one-third of the total of visitors came on the evenings mentioned.

Mr. HOYLE commented on the schemes of labelling mentioned in Mr Cameron's paper. He dwelt on the importance of good labels and the expense of having them printed, and he pointed out the economy that might be effected if Museums would join together and procure their labels in common. He suggested that the Association should take up the matter practically and appoint a Label Committee.

Mr. CARR exhibited specimens of labels and charts prepared for the Nottingham Museum. He spoke of the advisability of putting the English, as well as the scientific, name on the label wherever possible.

Mr. HOWARTH made a few remarks on the labelling adopted at Sheffield. He stated that white letters on a black ground had been found to be the neatest and plainest for most purposes. He also dwelt on the utility of Maps and Charts in Natural History Collections.

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A PLEA FOR LOCAL GEOLOGICAL MODELS.

BY

THOMAS J. MOORE, Cor. M.Z.S.

IN the Geological Museum, Jermyn Street, there is an excellent Model of London and the neighbourhood, so instructive as to suggest whether a Model of Liverpool and its neighbourhood might not be constructed, in some such manner, for the Liverpool Museum, to the public benefit.

"The Model of London and the neighbourhood was placed in the Geological Museum in the summer of 1873. The horizontal scale is 6 inches to the mile, and, as the dimensions represent a length of about 15 miles from East to West, and a breadth of about 11 miles from North to South, the area shown is about 165 square miles." The vertical scale is 200 feet to the inch, though to few eyes, perhaps, will there seem to be any exaggeration, for the Model is seen as from a great elevation.

"From the size of the Model it was inconvenient to make it all in one piece, and therefore the area to be represented was divided into *nine*, and advantage was taken of this arrangement to make the divisions in such a way that they should run along lines that would offer good sections."

"The nine parts are therefore irregular-shaped four-sided masses of unequal size. Of these the four at the corners are fixed, but each of the other five can be *independently* moved *upwards*, so as to bring up and show the *sections* which are clearly worked out along its sides. The total length of these sections is about 52 feet, representing 105 miles, and they are all carried down far below the level of the 'Ordnance Datum,' sometimes to more than 1,000 feet."

"Deep wells that occur on or close to the lines of sections, and of which any sufficient record exists, are drawn thereon."

The Model is contained in a light-framed case with glass top, ends and sides, measuring about 8 *feet long* (E-W) by 6 *feet wide* (N-S) and about 20 inches high. This case rests on a panelled case of the same length and breadth, and about

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30 inches high, containing the rack adjustment by which the several blocks are easily raised by an attendant; the whole admitting of convenient inspection from above, and on all four sides.

The Model is geologically coloured, and a key tablet to the colours is contained in a glazed frame attached to the case. A copy of the Geological Survey's "Guide to the Geology of London and the neighbourhood, by Wm. Whitaker, F.G.S., 1875," is also attached to the case for the use of visitors, and *contains full particulars of the Methods of Construction*, as well as descriptions of the various sections displayed in the Model; and from which the above particulars are taken, almost verbatim. The working of the Model was kindly shown to me by Mr. F. W. Rudler.

Such a local Geological Model would, I think, be an attactive and useful object in any Museum. All Museums are keenly alive to the attractiveness of that which can be seen nowhere else, and in such an instance as this, justifiably so, for it would be a matter of design and purpose, and not of accident. The local Geological Collection to be found in most Museums would be mutually illustrative, and *this*, of course, might be more or less in duplicate, but the model of a district not so, for the labour and cost of the model would be sufficiently prohibitive of any near rival.

It would appeal powerfully to local interest, and be of great educational value; and in all probability would be highly popular, as appealing to ordinary powers of observation as well as be useful for illustrating local earthworks, borings, &c.

The original construction of the Model of London was due to the representations of Mr. Trenham Reeks, the then Curator of the Museum, who urged the value of such a Model with regard to the practical applications of Geology. It was constructed by Mr. T. B. Jordan, and has been brought up to date, recent well-borings having furnished much additional information regarding the pre-cretaceous rocks underneath London.

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MUSEUM CASES AND MUSEUM VISITORS.

BY

E. HOWARTH, F.R.A.S., SHEFFIELD PUBLIC MUSEUM.

IN the address by Professor Flower to the Newcastle Meeting of the British Association in 1889, he lays great stress on the two distinct objects Museums may fulfil. He says "the real objects of forming collections are two, which are quite distinct and sometimes even conflicting," and then proceeds to specify the two classes of individuals for which such collections are formed. In the first class he places the specialist or advanced student, and then goes on to speak of the other, "and far larger, class to whom Museums are, or should be, a powerful means of aid in acquiring knowledge. This class, without having the time, the opportunities or the abilities to make a profound study of any branch of science, yet take a general interest in its progress, and wish to possess some knowledge of the world around them and of the principal facts ascertained with regard to it. To diffuse knowledge among persons of this class is the second of the two purposes of Museums. I believe that the main cause of what may be fairly termed the failure of the majority of Museums, especially Museums of Natural History, to perform the functions that might legitimately be expected of them, is that they nearly always confound together the two distinct objects which they may fulfil, and by attempting to combine both in the same exhibition practically accomplish neither." I think the experience of all Curators will confirm Professor Flower's classification of the visitors to a Museum, and though I cannot agree with him that the majority of Museums are failures, I certainly feel that they can be made more useful and successful if greater consideration is given to the distinctness of their two principal objects. There is, perhaps, a tendency on the part of Curators to sympathise more largely with the work of the advanced student or specialist, than

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with the curiosity, or vague efforts after knowledge of the bulk of the visitors. And this ofttimes arises from the fact that the Curator, while supposed to know all about the numerous and varied subjects comprised within a Museum, is, at heart and by training, a specialist and cannot easily overcome his desire to follow up the study of his own special subject, and develope his Museum chiefly in that direction.

Any one who is in the habit of walking through a Museum and noticing the people who frequent it, and the attitude they take up with reference to the objects, cannot fail to notice how, after a very short time, they become perfectly bewildered at the long rows of Mammals and Birds, and the numerous cases of Invertebrates, with their labels in English and Latin, oftentimes containing nothing more than the bare names and localities. If the visitor comes across a group of animals arranged in a natural and picturesque manner, he stops and utters some expression of admiration either of the beauty of the group or its suggestiveness of real life; and when he has to leave the building a very common expression heard from him is the great length of time it would take to look at all the things in the Museum. Now if he had carefully gone through the almost never ending rows of vertebrates, chiefly on stiff perches or wooden stands, and read all the names on them, and then performed the same office with the invertebrates, fossils and minerals, to say nothing of the other departments of the Museum, would he be any the wiser? Better in a certain sense he is, and he has given the Curator a lesson to guide him to arrange his Museum in such a way as will make it most useful. And that is don't let the ordinary every day visitor be bewildered and lost by forcing on his notice a multiplicity of objects entirely incomprehensible to him, and intended really for the specialist and advanced student.

It is not the general experience of Museums that there is greater difficulty in obtaining specimens than there is in

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obtaining suitable means for their exhibition. Want of space in a Museum is almost an universal complaint, and it is therefore all the more important that the very best use should be made of the space that is available.

At a meeting like this, where every one present is practically acquainted with Museum work, it would be presumption in me to offer an opinion as to the scope of a Museum. It is however a mistake, at any rate in large towns, to limit a Museum strictly to local objects, and it should be wide enough to include material necessary to an acquirement of a general knowledge of Natural History, and such other allied subjects as it may have the means of illustrating. But the method adopted for such illustration must, to a great extent, be regulated by the amount of space available. All Curators, I have no doubt, proud of any good things that come in their way, are anxious to find room for them in their cases, but some of these might be more serviceably utilised if, while still being accessible to those who wished to make use of them, they were less conspicuously placed.

We all recognise the desirability of including in our Museums a good representative collection of the local fauna and flora, and any other features of archæological and technological interest that may be peculiar to our neighbourhood, but, I think, we ought also to receive with equal avidity the collections illustrating any particular subject that any specialist in our neighbourhood may have acquired in the course of his special studies. This is a source from which many Museums derive their most interesting scientific treasures, and these collections should be most zealously preserved, and all the information the specialist has gathered together respecting them most carefully kept. They are of the greatest value to students, and if local Museums did not exist for their preservation, they would too often be broken up and lost when their authors died. No doubt, as Professor Flower said, it is better that such collections should be gathered together at a few convenient towns, rather than

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scattered about in Museums in different parts of the country, but for the present it is the duty of the Guardians of Museums to take care of these things, so that they may be forthcoming when wanted, and I think an Association like this may have an important influence in devising and carrying out schemes for the better utilisation of such special collections.

Having considered the visitors, and something of the nature of the specimens the Curator has to deal with, I would now turn to the question of Exhibition Cases. The training which is required to qualify a man to deal with the scientific work of a Museum is not such as best qualifies him to understand the mechanical construction of cases and fittings, but, as the microscopist must, to get the best work out of his instrument, know a good deal of the details of its construction, so must the Curator, in order to get the greatest amount of usefulness from his specimens, pay a good deal of attention to the forms and details of cases in which they are to be exhibited. But even a Curator is usually a better judge of what is required than an architect or decorator, with whom, too often, is left the designing of the cases for a new Museum, and the Curator has to regret, with an exceeding great regret, their sublime ignorance of what Museum Cases are required for.

The usual forms of Cases in Museums are upright wall cases, 8 or more feet high, with glass fronts and tops, and from 1 to 4 or 5 feet deep inside. In these are usually exhibited the Vertebrates, and you will often find them on rows one behind the other, and tier above tier until it is almost impossible to make out anything of the contents of the case at all. Now why should all these vertebrates be displayed? Would not the visitor understand more of all these creatures if a judicious selection were made of the characteristic animals, and let these be as few as possible, giving plenty of room to their display and arranging them in groups to show their natural haunts and habits, and putting with each group a descriptive label giving all the particulars about the group

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and its relations that can possibly be done. In this way the visitor has a series of life-like groups which he can see and perhaps understand. This method of mounting was first adopted by the Liverpool Museum, and is now frequently used by other Museums; sometimes, however, with not very satisfactory results, as, for instance, when it is attempted to bring into one group a large number of widely separated species.

Considering in this respect also the wants of the specialist. Let us take the class of birds. Any ornithologist will tell you he can study birds much better by means of a collection of skins than by mounted specimens. It is astonishing what a large number of bird skins can be arranged and stored in suitable cabinets. These should be constructed as explained further on, so that the student can readily see the contents without troubling the officials. By this means, not only would space be economised, but, a great saving would be effected in the cost of cases, while at the same time the Museum would be made much more interesting and useful.

Turning now to the invertebrates, fossils and minerals, we generally find that these are exhibited in table cases, often with two sloping sides and an upright compartment in the middle, and these cases generally occupy the floor space. But here again we find a redundancy of exhibited specimens and too frequent absence of labels and illustrations to make their history clear. How to make these groups of objects available and useful to the two classes of visitors is not quite so difficult as in the case of vertebrates, and we may have the gratification of knowing that all our visitors may be able to see the extent of our treasures if they wish. Let us take a table case, such as we find in the Museum in which we are met, with two sloping sides about 4 or 5 feet wide, 10 feet long and a suitable height for any one to see into it. Let there be an upright compartment with the top not less than 6 feet from the ground so that it will be above the eye. In one of these let us arrange on each side a series of trays about 2 feet wide and a sufficient depth to hold the specimens

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they have to contain, which need be only a few inches. We should thus have 10 trays and therein we could display a sufficient number of specimens of any one of the sub-kingdoms to satisfy the requirements of the ordinary visitor and give him a good intelligible idea of their variety, beauty and forms. To illustrate the whole of the invertebrates so far as was requisite for ordinary purposes would only require 5 or 6 of these cases or perhaps less. The upright compartment in the centre could be used for exhibiting the larger and more striking specimens of the group, and for drawings and descriptions illustrative of their life history. We have thus done what is required for the ordinary visitor, and now we must consider the student. For him we have the underneath part of the case, and instead of fitting this up with drawers enclosed in locked doors where we may store things we do not desire, or have not room, to exhibit, and where they too often become forgotten and decay, let us use it for the benefit of all those who wish to see and study our specimens. There will be room under the case for the same number of trays in a line as there is inside the case, that is 5, and with invertebrates and fossils there will be sufficient depth for us to get 6 trays one on top of the other. These trays should all be covered with a glazed lid fastened with a screw or button at the back, and on the side, about 4 inches from the back, there should be a piece of wood screwed on. The trays should work in grooves or on slips of wood on the carcase, and there should be a slip of wood or pilaster between each row of trays with a lock at the top, and a projecting piece of iron or brass at the bottom to fit into a hole at the bottom of the stand. When the drawers are pulled out the piece of wood on the side of the tray will come against the pilaster and prevent the tray being drawn entirely away, while at the same time the whole of its contents can be seen. In this way the amount of space available in the case and drawers beneath is equal to 7 table cases while occupying the space of one. I was led to adopt this form of cabinet, not so much with a view to saving space,

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but more to protect the colours of birds eggs and insects, and finding how well it served this purpose, I soon saw the advantage of utlising the space beneath the table cases, and have thus been able to put out a large number of fossils and minerals that were previously stowed away out of sight, and I hope in due course to be enabled to arrange the invertebrates in a similar manner. I have had a collection of Birds Eggs in one of these cabinets for 8 years, and a collection of British Insects for 4 years, and though there is no restriction on the visitors pulling out the drawers to look at the contents, there has been no accident of any kind. The public and students have had access to these collections, and there has been the minimum exposure to light, the light only getting to the specimens while the drawers were actually under inspection. By this method not only is the Curator's time saved, inasmuch as he has not to come and open cabinets for students to get at the specimens, but the students and visitors themselves are able to see what there is in the Museum, which they might not have known if the specimens had been locked up in cabinets. It is advisable to have doors to fit on to the front of these drawers, so that on crowded days the drawers may be shut off from the visitors to prevent obstruction, and students would find no great inconvenience in this, for it is not on crowded days that they find it desirable to prosecute their studies in a Museum. In the Sheffield Museum we have 200,000 visitors in a year and only on about four days a year is it necessary to lock up these drawers.

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WINTER EVENING LECTURES IN MUSEUMS.

BY

RICHARD PADEN,

ASSISTANT IN THE LIVERPOOL MUSEUM.

TWO years ago the Committee of this Institution decided to renew the evening opening of the Museum, from 7 to 10 on one night in the week, from the beginning of October to the end of March; the previous evening opening in the winters between 1863 and 1871 having failed, not from want of attendance on the part of the public, but through the misconduct of a large number of young people who regularly congregated in groups through the Museum, and prevented the examination of its contents.

On the re-opening of the Museum on Monday evening, October 1st, 1888, the Rev. H. H. Higgins delivered an address in which he said: "It is hardly to be expected that working men and working women will finish the labours of their day by entering upon a toilsome kind of study of the multifarious objects collected in a Museum."

With a view of encouraging this class of visitors as much as possible, and also with the intention of assisting them to concentrate their thoughts upon special parts of the collection, instead of rambling aimlessly through the Museum, short popular Lectures on selected specimens were given each Monday evening during the winter months. The Lectures did not exceed thirty minutes and were given in the public rooms, as close as possible to the specimens spoken of, with the intention that the visitors should have the objects in view whilst the lecture was being delivered. And this I must say was the least satisfactory part of the arrangement, for, when lectures were given on specimens on trays in the Table Cases, only about a dozen out of the 60 or 70 persons present were able to view the objects during the lecture, and thus a sight of any special feature in any of the specimens referred to by the lecturer, was lost to the majority of those present. Again, when lectures on Fossils were given, it was impossible to

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get the whole of the audience within hearing distance of the lecturer, as the geological galleries are 70 feet long and only 4 feet 6 inches wide.

The number of visitors to the Museum on Monday evenings from October 1st, 1888 to the end of March, 1889, amounted to 8044 giving an average of 309 per evening, and of these about 60 or 70 attended the lectures. During the past winter, that is from October 1st, 1889, to March 31st, 1890, the total for Monday evenings was 8368, giving an average per evening of 321, and the attendance at the lectures was about the same as the previous year. The total number of evening visitors to the Museum appears small, but the number of those who attended the lectures was satisfactory, for if more had come they would have caused great inconvenience, as the limitations of space and the interception of cases, would have prevented many of the visitors from hearing.

The alternative to these inconveniences in this Museum, would be to have the Lectures delivered in the Museum Lecture Room, and allow the audience to sit down, a boon which I know would be much appreciated, and to remove the specimens from the cases for their inspection.

The majority of those who attended the lectures were working men with their wives and families, and their general good conduct and attention was marked, and whenever, at the close of a Lecture, the lecturer solicited questions or offered to accompany those who wished to go round the cases to examine the specimens upon which he had spoken, I am sure that in every instance he must have been highly gratified at the eagerness shown for further information.

I have been asked if it would not be convenient to have Lectures during the summer months. With respect to this Museum I am sure it would not be convenient, because our summer visitors are largely composed of Excursionists whose time is too limited to attend lectures, and I feel confident that the out-door attractions are too numerous for us to secure a local

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audience, but I think that lectures might be given on certain afternoons during the winter months.

During the first season (1888-9) six Lectures on Vertebrates, seven on Invertebrates, two on Osteological subjects, five on Geology and Mineralogy and six on Antiquites, &c., were given, and during the past Winter six Lectures on Vertebrates, nine on Invertebrates, five on Geology and Mineralogy, and six on Egyptian and other Antiquarian remains. The lectures were given by the Rev. H. H. Higgins, the Curator and others of the Museum staff, assisted by members of the various local Scientific Societies, including a lady, all of whom most generously gave their services, so that the fifty-two lectures were delivered free of cost.

Now that we have had two sessions of Popular Lectures, I would like to see these lectures continued in a more systematic manner, for example beginning with the lowest forms of life and continuing step by step up to the higher Vertebrates, and not to go on in the irregular way we have been, passing from Crustacea to Coal Fossils and then on to Zoophytes, which conveys no idea of progression; but in doing this I would still urge upon the lecturers the advisability of avoiding technical terms, and to make free use of simple language, easily understood by the working classes, for it is from their ranks that we must look for the greater number of visitors to Museums on Winter evenings.

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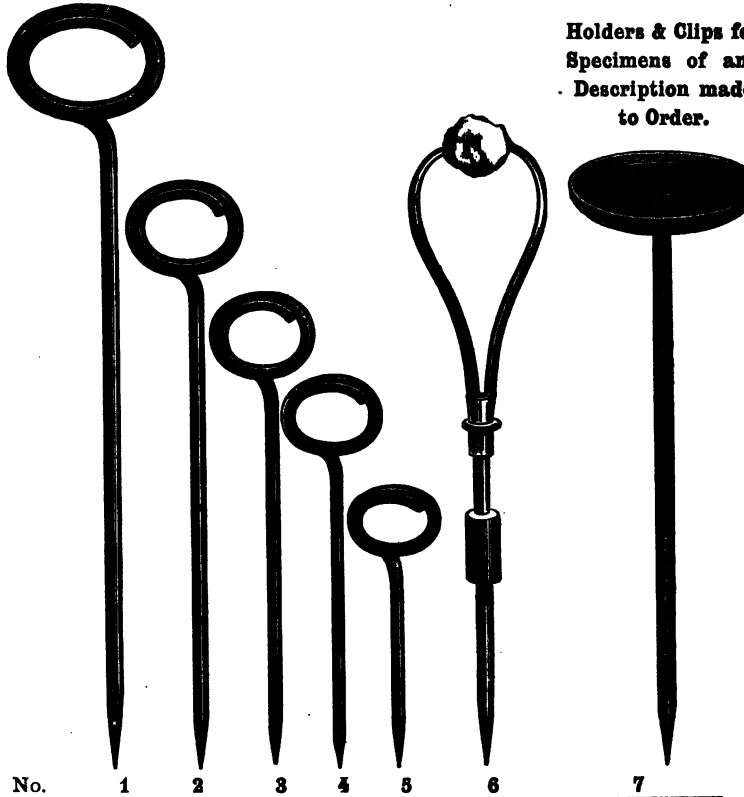

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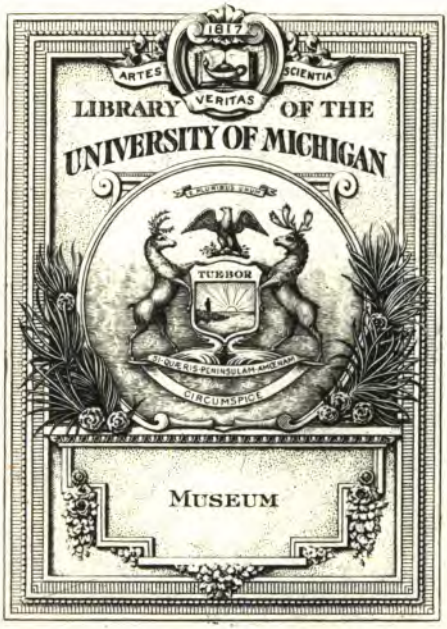

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